34 MORE Tested, Ready-To-Run Game Programs in BASIC

by Delton T. Horn

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Contents

Preface

Computers have countless practical applications in business, science, education, home finance and many other fields. But there's no reason why they can't be used for fun and games too.

This book is a collection of fun and helpful programs. They've provided me with hours of entertainment, and I hope they can do the same for you. Some (*Coin Flipper, Craps, Hangman*, for example) are fairly standard games. Others (*Money Mad, Crops, Freebish!*) are more unique. Some (*Favorite Song, Surprise Poem*) aren't even games, but computerized gags: you'll just have to run the programs to find out what they do!

For each program, I've given two complete listings. One is in standard BASIC, which can be run on most home computers either directly or with only minor changes. The second set of listings is in the abbreviated BASIC used in Radio Shack's Level I TRS-80 computer.

Unfortunately, there isn't much standardization in graphics generation. For this reason none of the games in this book use graphics. You can, however always program in your own graphics.

Some of the programs in this book are quite simple, or based on luck. Others can be quite challenging to play. Some are designed to help you. *All* are designed for fun. I hope you enjoy them.

Delton T. Horn

Chapter 1
One-Player Games
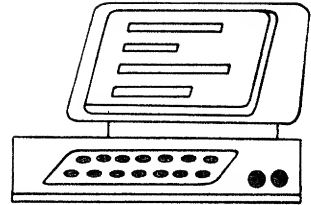
This chapter contains an assortment of games which pit a single player against the computer. They range from the familiar (*Craps* and *Hangman*) to the bizarre (*Freebish!*), and from games of luck (*Craps*), through games of simple logic (*High/Low*) and games of strategy and choices (*Crops* and *Galactic Search*). I hope you find them fun and challenging. Feel free to program in any variations you might think of.

Craps

Just in case you're not familiar with the game of Craps, let's discuss how it's played. You make a bet (step 15) and roll a pair of dice (steps 85 - 120). If you roll two one's (Snake eyes, steps 25 & 160) or two six's (Boxcars, steps 30 & 175) on your first roll, you lose. On the other hand, if the total of the dice on your first roll equals 7 or 11 (steps 35, 40 & 125), you win. Any other total is recorded as your point and you roll again (steps 45 & 50).

You keep rolling until you match your point (steps 65 & 125) or get 7 or 11 for a total (steps 70, 75 & 185). Matching your point wins, but getting a 7 or 11 on any but the first roll loses.

The computer uses a random number generator to simulate rolling the dice (steps 95 - 110): each of the dice can be from 1 to 6, so the totals can be from 2 to 12. The computer checks for wins and losses, and keeps tabs on your bets if you play more than one round.

Of course this is a game of pure chance so it does not take skill or strategy to play. Consequently, it won't be as entertaining as many of the other games in this book. But the program is simple and fun, and it's worth running a few times just for kicks. See Fig. 1-1 for the flowchart.

Standard BASIC

```
10   PRINT"LET'S SHOOT SOME CRAPS,PAL!":PRINT
12   LET F=0
14   PRINT"WHAT IS YOUR BET":
16   INPUT E
20   GOSUB 85
25   IF C=2 THEN GOTO 160
30   IF C=12 THEN GOTO 175
35   IF C=7 THEN GOTO 125
40   IF C=11 THEN GOTO 125
45   LET D=C
50   PRINT"YOUR POINT IS";D
55   GOSUB 85
60   PRINT "YOUR POINT WAS";D
63   GOSUB 120
67   IF C=D THEN GOTO 125
70   IF C=7 THEN GOTO 185
75   IF C=11 THEN GOTO 185
80   GOTO 55
85   PRINT"PRESS 'ENTER' TO ROLL"
87   INPUT A$
```
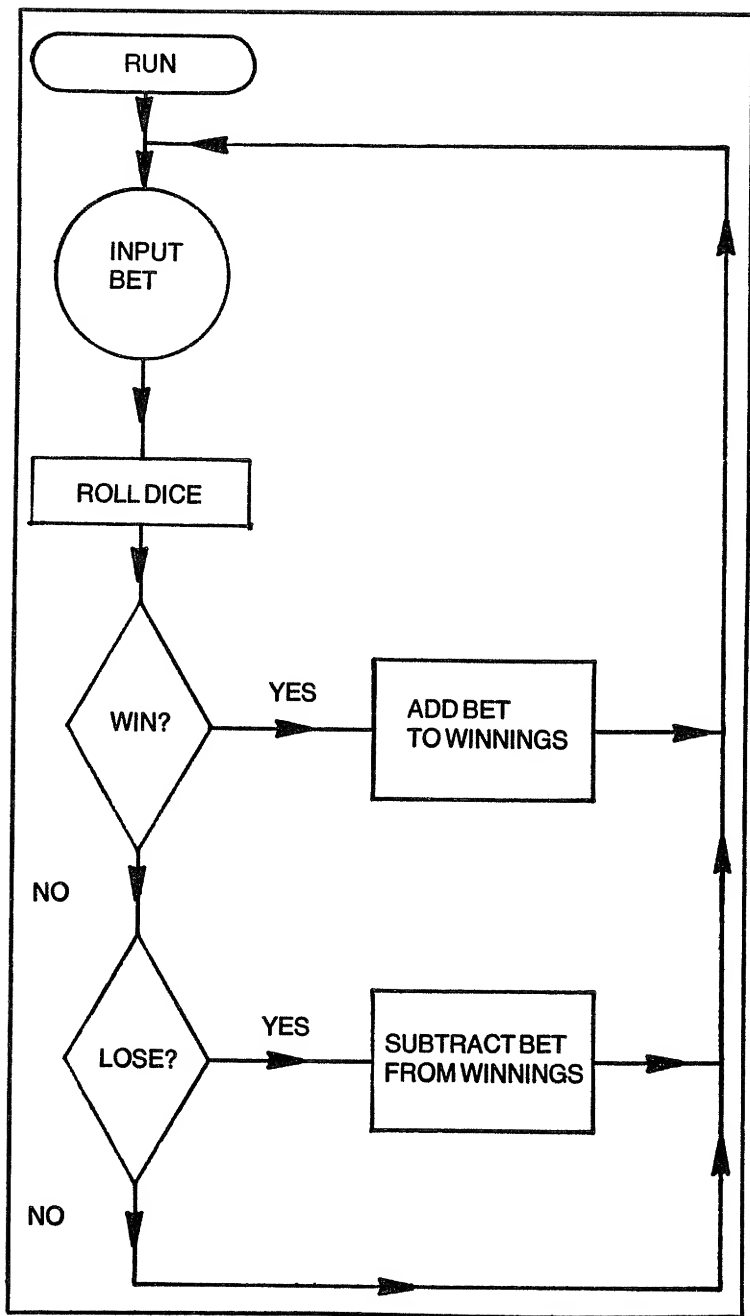
Fig. 1-1. Craps flowchart.

```
 90   FOR X=1TO200:NEXT X
 95   LET A=INT(RND(0)*6)+1
100   LET B=INT(RND(0)*6)+1
105   PRINT:PRINT" ","*** ";A,"YOUR ROLL",B;" ***"
110   LET C=A+B
115   PRINT:PRINT:PRINT"YOU JUST ROLLED ";C
120   FOR X=1TO333:NEXT X:RETURN
125   PRINT" ","YOU WIN!"
130   LET F=F+E
135   IF F<0 THEN GOTO 195
140   PRINT"SO FAR YOU'VE WON $";F
145   LET Y=1:LET N=0
147   PRINT"WANT TO PLAY AGAIN";
149   INPUT G
152   IF G=1 THEN GOTO 15
155   END
160   PRINT" SNAKE EYES!"
162   GOSUB 120
165   PRINT" ","YOU LOSE!"
170   LET F=F-E
172   GOTO 135
175   PRINT"BOX CARS!"
180   GOTO 162
185   PRINT"YOU CRAPPED OUT!"
190   GOTO 162
195   PRINT"SO FAR YOU'VE LOST $";F
200   GOTO 145
```

TRS-80 BASIC

```
 10   P."LET'S SHOOT SOME CRAPS,PAL!":P.:F=0
 15   IN."WHAT'S YOUR BET";E:GOS.70:IF C=2 G.135
 20   IF C=12 G.145
 25   IF C=7 G.105
 30   IF C=11 G.105
 35   D=C:P."YOUR POINT IS ";D
 40   GOS.70:P."YOUR POINT WAS ";D:GOS.100:IFC=D G. 105
 45   IF C=7 G. 150
 50   IF C=11 G. 150
 55   G.40
 70   IN."PRESS 'ENTER'TO ROLL ";A$:F.X=1TO200:N.X
 75   G=RND(30)+10:F.H=1TOG:A=RND(6):B=RND(6):CLS
 80   P.:"P. "***";A,"YOUR ROLL",B;" ***"
 85   F.X=1TO25:N.X:N.H:C=A+B:P."YOU JUST ROLLED ";C
 90   F.X=1TO333:N.X:RET.
105   P." ","YOU WIN!":F=F+E
110   IF F<0 G.155
```

```
115   P."SO FAR YOU'VE WON $";F
120   Y=1:N=0:IN."WANT TO PLAY AGAIN";G:IFG=1 G.15
125   END
135   P."SNAKE EYES!"
140   P." ","YOU LOSE!":F=F-E:G.110
145   P." BOX CARS!":G.140
150   P."YOU CRAPPED OUT!":G.140
155   P."SO FAR YOU'VE LOST $";F:G.120
```

Sample Run

```
LET'S SHOOT SOME CRAPS, PAL!
WHAT'S YOUR BET? 100
PRESS 'ENTER' TO ROLL ?__
*** 5     YOUR ROLL     3 ***
YOU JUST ROLLED 8
YOUR POINT IS 8
PRESS 'ENTER' TO ROLL ?__
*** 4     YOUR ROLL     2 ***
YOU JUST ROLLED 6
YOUR POINT WAS 8
PRESS 'ENTER' TO ROLL ?__
*** 6     YOUR ROLL     1 ***
YOU JUST ROLLED 7
YOU CRAPPED OUT
                          YOU LOSE!
SO FAR YOU'VE LOST $100
WANT TO PLAY AGAIN? YES
WHAT'S YOUR BET? 250
PRESS 'ENTER' TO ROLL ?__
*** 6     YOUR ROLL     5 ***
YOU JUST ROLLED 11
                          YOU WIN!
SO FAR YOU'VE WON $150
WANT TO PLAY AGAIN? NO
```

Summary of Variables Used

A   Die #1
B   Die #2
C   Total of last roll
D   Point
E   Current bet
F   Record of winnings (or losses)
G   Timing
H   Timing
N   No (to "PLAY AGAIN?")
X   Timing
Y   Yes (to "PLAY AGAIN?")

High/Low

High/Low is probably the simplest game in this book. The computer randomly selects a number which you try to guess. You get seven tries, and each time the computer tells you if you are too high or too low. In the easy version the number is between 1 and 25. The medium version is between 1 and 40, and the hard version is between 1 and 55. If you prefer you can enter any upper limit you like when the computer asks you if you want an easy, medium or hard game (step 20). The computer only looks at the first letter of any word you type: entering "EASY", "EGG", or just "E" will all be the same to the machine. The values for E, M and H are set in line 15, but you can just enter a number instead of one of the variables. Entering "8" would make for a pathetically easy game, and entering "888888" would be practically impossible.

The computer asks you for a guess seven times (steps 45 to 75). Your guess (called F in the program) is compared to the computer's number (X). If there is a match, the program will be sent to steps 105 to 145 for a win statement. Otherwise the computer determines if your guess is too high or too low and prints the appropriate statement.

If you haven't found the correct number by your seventh guess, the computer tells you the correct number and ends the game. See Fig. 1-2 for the flowchart.

Standard BASIC

```
10   PRINT:PRINT" ","HIGH/LOW":PRINT
15   LET E=25:LET M=40:LET H=55
20   INPUT"EASY, MEDIUM, OR HARD GAME";G
25   LET X=INT(RND(1)*G)+1
30   FOR Z=1 TO 555:NEXT Z
35   PRINT"I AM THINKING OF A NUMBER FROM 1 TO ";G
40   PRINT"YOU GET 7 GUESSES":PRINT
42   FOR Z=1 TO 444:NEXT Z
45   FOR Y=1 TO 7
50   INPUT "YOUR GUESS";F
55   FOR Z=1 TO 333:NEXT Z
60   IF F=X GOTO 105
65   IF F > X PRINT "TOO HIGH!"
70   IF F < X PRINT "TOO LOW!"
75   NEXT Y
80   PRINT"SORRY. TIME'S UP."
```
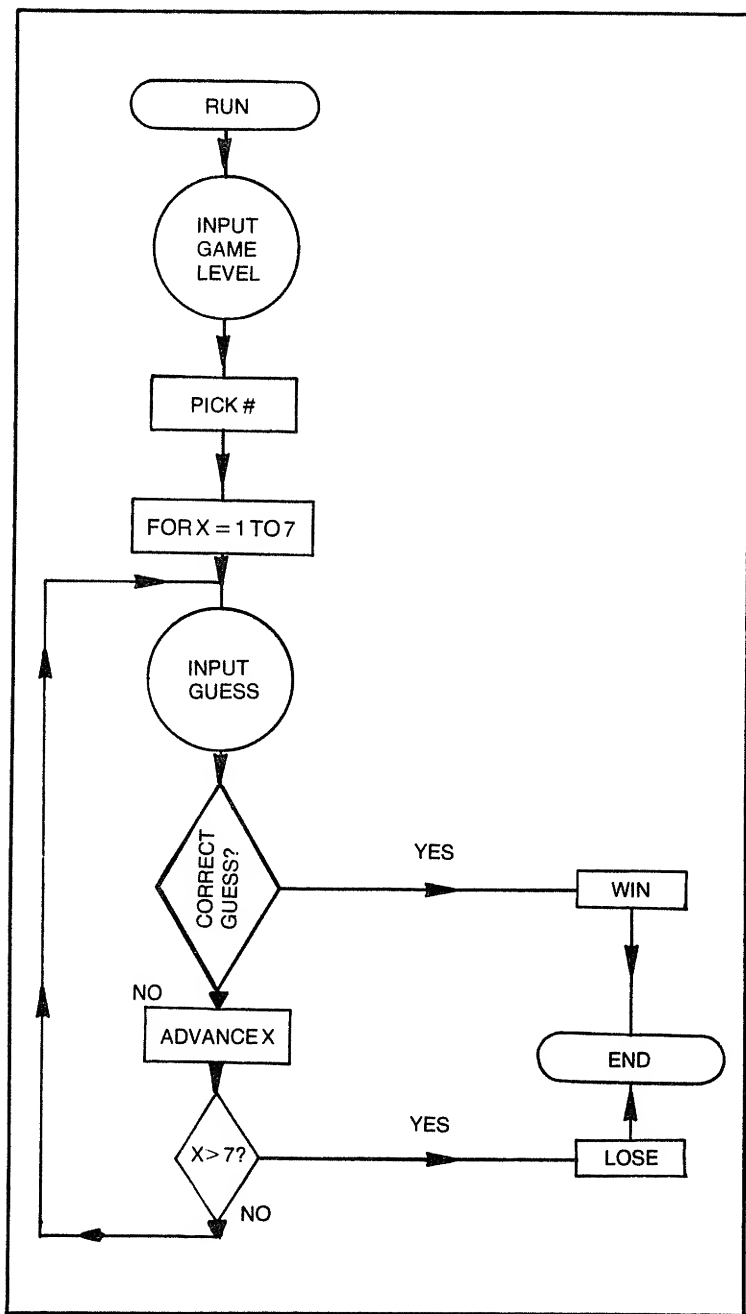
Fig. 1-2. High-Low flowchart.

```
 85   PRINT "THE NUMBER WAS ";
 90   FOR Z=1 TO 333:NEXT Z
 95   PRINT X
100   END
105   FOR L=1 TO 20
110   FOR Z=1 TO 20
115   PRINT
120   NEXT Z
125   PRINT" ","WINNER!"
130   FOR Z=1 TO 50:NEXT Z
135   NEXT L
140   PRINT:PRINT"THE NUMBER WAS ";X
145   PRINT"YOU GOT IT ON GUESS #";Y
150   END
```

TRS-80 BASIC

```
10   P.:P." ","HIGH/LOW":P.:E=25:M=40:H=55
15   IN."EASY, MEDIUM OR HARD GAME";G:X=RND(G)
20   F.Z=1 TO 555:N.Z:P."I AM THINKING OF A NUMBER FROM 1
     TO ";G
25   P."YOU GET 7 GUESSES.":P.:F.Z=1 TO 444:N.Z
30   F.Y=1 TO 7:IN. "YOUR GUESS";F:F.Z=1 TO 333:N.Z
35   IF F=X G.60
40   IF F > X P."TOO HIGH!"
45   IF F < X P."TOO LOW!"
50   N.Y:P."SORRY. TIME'S UP.":P."THE NUMBER WAS ";
55   F.Z=1TO333:N.Z:P.X:END
60   F.L=1TO20:CLS:P.:P.:P.:F.Z=1TO50:N.Z
65   P." ","WINNER!":F.Z=1TO50:N.Z:N.L:P.
70   P."THE NUMBER WAS ";X:P."YOU GOT IT ON GUESS #";Y
75   END
```

Sample Run

                          HIGH/LOW
EASY, MEDIUM OR HARD GAME? EASY
I AM THINKING OF A NUMBER FROM 1 TO 25
YOU GET 7 GUESSES
YOUR GUESS? 10
TOO LOW!
YOUR GUESS? 20
TOO HIGH!
YOUR GUESS? 15
TOO LOW!
YOUR GUESS? 17
                          WINNER!
THE NUMBER WAS 17
YOU GOT IT ON GUESS #4

Summary Of Variables Used

E   Easy game. E=25
F   Guess
F   Game range
H   Hard game. H=55
L   Timing variable
M   Medium game. M=40
X   Secret number
Y   Guess count
Z   Timing variable

Guess The Variables

This game is simple enough in concept: it's another number guessing game. But playing this one just might tax your mathematical abilities somewhat. If you always hated algebra, you might want to skip ahead to the next chapter, but if you enjoy solving a good puzzle, read on.

The object of the game is to guess the value of the four variables (A, B, C & D). In an easy game they are between 1 & 10, in a medium game they are between 1 & 20, and in a hard game they are between 1 & 40.

If you request a clue (steps 45, 50, & 225 - 485) the computer will give you an algebraic equation using two or more of the variables, and tell you the result. For example, the computer might give you the following clue; "C+ D/A = 7". By combining several of these clues, you try to determine what the individual variables are.

If you decide to guess the variables (steps 45, 55, & 115 - 170) the computer will ask for each variable in turn, comparing your guesses with the correct answers. If you get all four right, you win, of course (steps 165 & 175 - 210). If you miss any, the computer will tell you how many you had right, but not which ones, and count it as half a clue.

You get up to 20 clues (step 60), then you must take one final stab at guessing the variables (steps 70-80 & 115 - 170). If you miss this time, the computer prints out the correct answers, (steps 85 - 110) and you lose.

The first clue is always the sum of the four variables (A + B + C + D) (steps 30 & 35). The other clues are randomly chosen from a list of 25 equations (steps 225 - 485). The computer keeps track of which equations have already been used, so no clue will be used twice in one game (steps 230 & 235).

You might want to use a calculator to help you play this game, or at least a pencil and paper.

This is a good game to teach children math, but let them have fun with it. If you turn it into an extra chore nobody will get much out of it.

It's also a good puzzler for adults. You might want to add some additional clues yourself. I think the program makes it quite obvious how this is done.

Standard BASIC

```
  5   FOR Z=1TO25:PRINT:NEXT Z
 10   PRINT"GUESS THE VARIABLES":PRINT
 15   LET E=10:LET M=20
 17   LET H=40:LET Q=1
 20   PRINT"EASY, MEDIUM OR HARD";:INPUT V
 22   LET A=INT(RND(1)*V)+1
 24   LET B=INT(RND(1)*V)+1
 26   LET C=INT(RND(1)*V)+1
 28   LET D=INT(RND(1)*V)+1
 30   LET X=A+B+C+D
 35   PRINT"A+B+C+D=";X
 40   FOR Z=1TO25:LET A(Z)=0:NEXT Z
 45   PRINT"ENTER 1 FOR CLUE OR 2 TO GUESS ";
 47   INPUT W
 50   IF W=1 GOSUB 225
 55   IF W=2 GOSUB 115
 60   IF Q>19.5 GOTO 70
 65   GOTO 45
 70   PRINT"SORRY. YOU'VE HAD 20 CLUES."
 75   PRINT"HERE'S YOUR LAST CHANCE TO GUESS."
 80   GOSUB 115
 85   PRINT"HERE ARE THE CORRECT ANSWERS";:PRINT
 90   PRINT"A = ";:GOSUB 220:PRINT A
 95   PRINT"B = ";:GOSUB 220:PRINT B
100   PRINT"C = ";:GOSUB 220:PRINT C
105   PRINT"D = ";:GOSUB 220:PRINT D
110   END
115   PRINT"A =";:INPUT E
120   PRINT"B =";:INPUT F
125   PRINT"C =";:INPUT G
130   PRINT"D =";:INPUT H
135   LET T=0: IF E=A THEN LET T=T+1
140   IF F=B THEN LET T=T+1
145   IF G=C THEN LET T=T+1
150   IF H=D THEN LET T=T+1
155   FOR Z=1TO444:NEXT Z
160   PRINT "YOU GOT ";T;"VARIABLES CORRECT."
165   IF T=4 GOTO 175
170   LET Q=Q+0.5:RETURN
175   PRINT"YOU USED ";Q;" CLUES."
180   IF Q<10 PRINT"FANTASTIC!"
185   IF Q<4 PRINT"DID YOU CHEAT?"
190   IF Q>16 PRINT"I'M NOT PARTICULARLY IMPRESSED."
195   END
220   FOR Z=1TO333:NEXT Z;RETURN
```

```
225   LET S=INT(RND(0)*25)+1
230   IF A(S)=1 GOTO 225
235   LET A(S)=1:LET Q=Q+1
240   IF S=1 GOTO 370
245   IF S=2 GOTO 380
250   IF S=3 GOTO 390
255   IF S=4 GOTO 400
260   IF S=5 GOTO 410
265   IF S=6 GOTO 420
270   IF S=7 GOTO 430
275   IF S=8 GOTO 440
280   IF S=9 GOTO 450
285   IF S=10 GOTO 460
290   IF S=11 GOTO 470
295   IF S=12 GOTO 480
300   IF S=13 GOTO 490
305   IF S=14 GOTO 500
310   IF S=15 GOTO 510
315   IF S=16 GOTO 520
320   IF S=17 GOTO 530
325   IF S=18 GOTO 540
330   IF S=19 GOTO 550
335   IF S=20 GOTO 560
340   IF S=21 GOTO 570
345   IF S=22 GOTO 580
350   IF S=23 GOTO 590
355   IF S=24 GOTO 600
360   LET X=A+B
365   PRINT"A+B=";X:RETURN
370   LET X=A+C
375   PRINT"A+C=";X:RETURN
380   LET X=A+D
385   PRINT"A+D=";X:RETURN
390   LET X=B+C
395   PRINT"B+C=";X:RETURN
400   LET X=B+D
405   PRINT"B+D=";X:RETURN
410   LET X=C+D
415   PRINT"C+D=";X:RETURN
420   LET X=A*B*C*D*
425   PRINT"A X B X C X D =";X:RETURN
430   LET X=A*B
435   PRINT"A X B =";X:RETURN
440   LET X=A*C
445   PRINT"A X C =";X:RETURN
450   LET X=A*D
455   PRINT"A X D =";X:RETURN
```

```
460   LET X=B*C
465   PRINT"B X C =";X:RETURN
470   LET X=B*D
475   PRINT"B X D=";X:RETURN
480   LET X=C*D
485   PRINT"C X D =";X:RETURN
490   LET X=A+B/C
495   PRINT"A + B/C =";X:RETURN
500   LET X=B+C/D
505   PRINT"B + C/D =";X:RETURN
510   LET X=C+D/A
515   PRINT"C + D/A =";X:RETURN
520   LET X=(A+B)*(C−D)
525   PRINT"(A+B)X(C−D)=";X:RETURN
530   LET X=(B−A)*(C+D)
535   PRINT"(B−A)X(C+D)=";X:RETURN
540   LET X=A*B−C
545   PRINT"A X B − C =";X:RETURN
550   LET X=A*(B−C)
555   PRINT"A X (B−C)=";X:RETURN
560   LET X=A*A−B
565   PRINT"A SQUARED − B =";X:RETURN
570   LET X=A*A−C
575   PRINT"A SQUARED − C =";X:RETURN
580   LET X=B*B−D
585   PRINT"B SQUARED − D =";X:RETURN
590   LET X=D*D−A
595   PRINT"D SQUARED − A =";X:RETURN
600   LET X=C*C−(A/(B*B))+D
605   PRINT"C SQUARED − A/B SQUARED + D ="; X
610   RETURN
```

TRS-80 BASIC

```
10   CLS:P.:P."GUESS THE VARIABLES":E=10:M=20:H=40
15   Q=1:IN."EASY, MEDIUM OR HARD ";V
20   A=RND(V):B=RND(V):C=RND(V):D=RND(V):X=A+B+C+D
25   P."A+B+C+D=";X:F.Z=1TO25:A(25)=0:N.Z
30   IN."ENTER 1 FOR CLUE OR 2 TO GUESS";W:IF W=1 GOS.225
35   IF W=2 GOS.75
40   IF Q>19.5 G.50
45   G.30
50   P."SORRY. YOU'VE USED 20 CLUES."
55   P."HERE'S YOUR LAST CHANCE TO GUESS THE
     VARIABLES":GOS.75
60   P."HERE ARE THE CORRECT ANSWERS":P.:P."A = ";
65   GOS.220:P.A:P."B = ";:GOS.220:P.B:P."C = ";
```

```
70   GOS.220:P.C:P."D =";:GOS.220:P.D:END
75   T=0:IN."A =";E:IN."B =";F:IN."C =";G
80   IN."D =";H:IF E=A THEN T=T+1
85   IF F=B THEN T=T+1
90   IF G=C THEN T=T+1
95   IF H=D THEN T=T+1
100  F.Z=1TO444:N.Z:P."YOU GOT ";T;" VARIABLES CORRECT."
105  IF T=4 G.120
110  Q=A+0.5:RET.
120  P."YOU USED ";Q;" CLUES.":IF Q<10 P."FANTASTIC!"
125  IF Q<4 P."DID YOU CHEAT?"
130  IF>16 P."I'M NOT PARTICULARLY IMPRESSED."
135  END
220  F.Z=1TO333:N.Z:RET.
225  S=RND(25)
230  IF A(S)=1G.225
235  A(S)=1:Q=Q+1:IF S=1G.365
240  IF S=2G.370
245  IF S=3G.375
250  IF S=4G.380
255  IF S=5G.385
260  IF S=6G.390
265  IF S=7G.395
270  IF S=8G.400
275  IF S=9G.405
280  IF S=10G.410
285  IF S=11G.415
290  IF S=12G.420
295  IF S=13G.425
300  IF S=14G.430
305  IF S=15G.435
310  IF S=16G.440
315  IF S=17G.445
320  IF S=18G.450
325  IF S=19G.455
330  IF S=20G.460
335  IF S=21G.465
340  IF S=22G.470
345  IF S=23G.475
350  IF S=24G.480
355  X=A+B:P."A+B=";X:RET.
365  X=A+C:P."A+C=";X:RET.
370  X=A+D:P."A+D=";X:RET.
375  X=B+C:P."B+C=";X:RET.
380  X=B+D:P."B+D=";X:RET.
385  X=C+D:P."C+D=";X:RET.
390  X=A*B*C*D:P."A X B X C X D =";X:RET.
```

```
395   X=A*B:P.“A X B =";X:RET.
400   X=A*C:P.“A X C =";X:RET.
405   X=A*D:P.“A X D =";X:RET.
410   X=B*C:P.“B X C =";X:RET.
415   X=C*D:P.“C X D =";X:RET.
420   X=B*D:P.“B X D =";X:RET.
425   X=A+B/C:P.“A+ B/C=";X:RET.
430   X=B+C/D:P.“B + C/D =";X:RET.
435   X=C+D/A:P.“C + D/A =";X:RET.
440   X=(A+B)*(C−D):P.“(A+B)X(C−D)=";X:RET.
445   X=(B−A)*(C+D):P.“(B−A)X(C+D)=";X:RET.
450   X=A*B−C:P.“A X B − C =";X:RET.
455   X=A*(B−C):P.“A X (B−C)=";X:RET.
460   X=A*A−B:P.“A SQUARED − B =";X:RET.
465   X=A*A−C:P.“A SQUARED − C =";X:RET.
470   X=B*B−D:P.“B SQUARED − D =";X:RET.
475   X=D*D−A:P.“D SQUARED − A =";X:RET.
480   X=C*C−(A/(B*B))+D:P.“C SQUARED − A/B SQUARED +
      D=";X
485   RET.
```

Sample Run

```
GUESS THE VARIABLES
EASY, MEDIUM, OR HARD ?EASY
A+B+C+D=20
ENTER 1 FOR CLUE OR 2 TO GUESS  ?1
B+D=12
ENTER 1 FOR CLUE OR 2 TO GUESS  ?1
A X B − C =32
ENTER 1 FOR CLUE OR 2 TO GUESS  ?1
A SQUARED − B = 18
ENTER 1 FOR CLUE OR 2 TO GUESS  ?1
C X D =15
ENTER 1 FOR CLUE OR 2 TO GUESS  ?2
A =   ?6
B =   ?5
C =   ?5
D =   ?3
YOU GOT 0 VARIABLES CORRECT.
ENTER 1 FOR CLUE OR 2 TO GUESS  ?1
C SQUARED − A/B SQUARED + D =13.89796
ENTER 1 FOR CLUE OR 2 TO GUESS  ?1
B X D =35
ENTER 1 FOR CLUE OR 2 TO GUESS  ?2
A =   ?4
B =   ?7
```

```
C =    ?3
D =    ?5
YOU GOT 3 VARIABLES CORRECT.
ENTER 1 FOR CLUE OR 2 TO GUESS ?1
A+D=10
ENTER 1 FOR CLUE OR 2 TO GUESS   ?2
A =    ?5
B =    ?7
C =    ?3
D =    ?5
YOU GOT 4 VARIABLES CORRECT.
YOU USED 8 CLUES.
FANTASTIC!
>READY
```

Summary of Variables Used

A   unknown variable #1
B   unknown variable #2
C   unknown variable #3
D   unknown variable #4
E   Easy — E=10 / Guess variable A
F   Guess variable B
G   Guess variable C
H   Hard — H=40 / Guess variable D
M   Medium — M=20
Q   Clue count
S   Clue selection
W   Clue or guess?
V   Game level
X   Result of clue
Z   Timing variable

Hangman

Hangman is a popular old pencil and paper game. In this version the computer selects a five letter word (out of 50 pre-programmed possibilities) and you have to guess what it is, letter by letter. If you correctly guess a letter it is printed in the proper position in the secret word. If it is used in the word more than once it will be printed wherever it occurs. An incorrect guess adds another letter to the word HANGMAN. If you spell HANGMAN before completing the secret word, you lose. Guessing the secret word, of course, is a win. You get a maximum of 11 letter guesses for each word, and 13 different letters are used in the various secret words.

On each play you're reminded that the letters B, D, G, J, M, Q, U, V, X, Y, and Z are not to be used. These letters are used as variables to run the program. V, W, X, Y, and Z are especially to be avoided since these are the variables that contain the secret word. To preserve program simplicity you are left on your honor not to use these letters, since the computer cannot distinguish between them and a correct guess. See Fig. 1-3 for the flowchart.

If you lose, the computer will tell you what the secret word was.

Of course you can program in your own words. For example, if you want to add the word "HORSE". Change line 30 to LET U=INT(RND(0)*51)+1. Then add the following steps:

```
 121   IF U>50 THEN GOTO 1025
1025   LET V=15:LET W=19
1030   LET X=20:LET Y=21
1035   LET Z=13
1040   GOTO 140
       OR you could substitute
1025   LET V=H:LET W=O
1030   LET X=R:LET Y=S
1035   LET Z=E
```

The numerical values of the letters are given in steps 07 to 14. Since this program is largely repetitive, only a portion of a sample run is given.

Standard BASIC

```
 05   REM*SET LETTER VALUES*
 07   LET A=11:LET C=12:LET E=13:LET F=14
```

```
10   LET H=15:LET I=16:LET K=17:LET L=18
12   LET N=23:LET O=19:LET R=20:LET S=21
14   LET T=22:LET D=0:LET G=0:LET J=0
16   LET M=0:LET Q=0
18   REM*CLEAR WRONG GUESS COUNTER*
20   FOR X=1TO20:LET A(X)=0:NEXT X
25   REM*RANDOM WORD SELECTION*
30   LET U=INT(RND(0)*50)+1
35   IF U<4 THEN GOTO 500
40   IF U<9 THEN GOTO 525
45   IF U<14 THEN GOTO 565
50   IF U<19 THEN GOTO 600
55   IF U<23 THEN GOTO 635
60   IF U<26 THEN GOTO 665
65   IF U<29 THEN GOTO 690
70   IF U<33 THEN GOTO 715
75   IF U<36 THEN GOTO 755
80   IF U<38 THEN GOTO 775
85   IF U=38 THEN GOTO 795
90   IF U<41 THEN GOTO 800
95   IF U=41 THEN GOTO 820
100  IF U=42 THEN GOTO 825
105  IF U<45 THEN GOTO 830
110  IF U=45 THEN GOTO 845
115  IF U=46 THEN GOTO 850
120  IF U<49 THEN GOTO 855
122  LET V=22
125  IF U=49 THEN GOTO 870
130  LET W=13:LET X=13
135  LET Y=22:LET Z=15
140  REM*THE PLAY*
145  CLS:PRINT" ","HANGMAN"
147  PRINT"THESE LETTERS ARE NOT USED — B,D,G,J,"
150  PRINT"M,Q,U,V,W,X,Y, & Z."
152  LET B=A(15)
154  IF B=0 THEN GOTO 165
156  PRINT"LETTERS USED SO FAR —";
158  FOR U=1TO B:LET A(19)=A(U)
160  GOSUB 880
162  NEXT U
165  PRINT:PRINT
170  IF A(17)=0 THEN PRINT"——"
175  IF A(17)=1 THEN PRINT"H——"
180  IF A(17)=2 THEN PRINT"HA——"
185  IF A(17)=3 THEN PRINT"HAN——"
190  IF A(17)=4 THEN PRINT"HANG——"
```
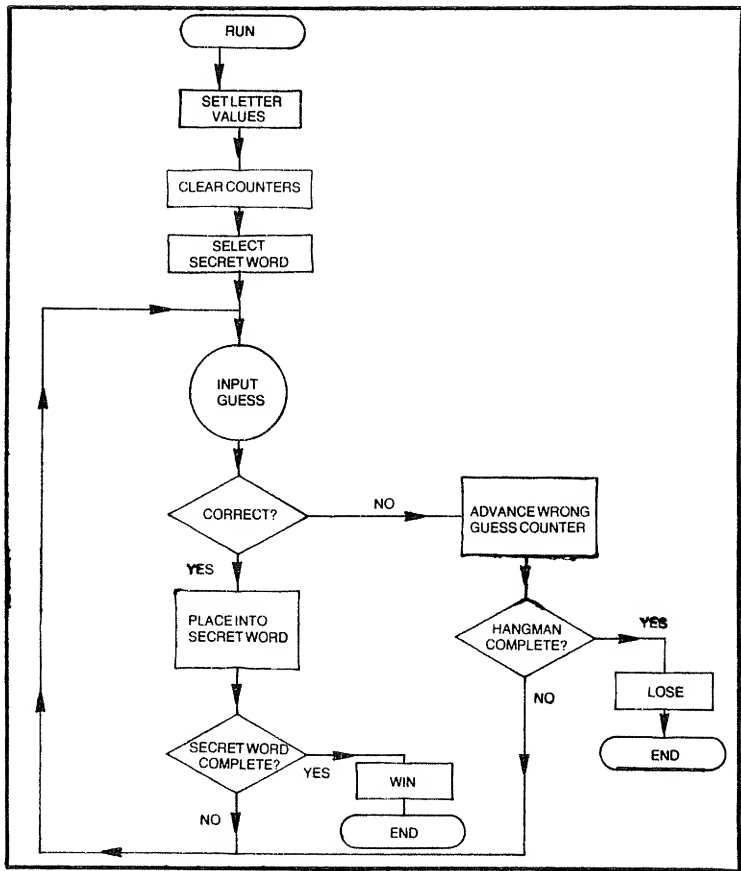
Fig. 1-3. Hangman flowchart.

```
195  IF A(17)=5 THEN PRINT"HANGM—"
200  IF A(17)=6 THEN PRINT"HANGMA—"
205  IF A(17)=7 THEN GOTO 950
210  PRINT:PRINT:PRINT" ","*";
212  LET A(18)=0
215  LET A(19)=D:GOSUB 875
220  LET A(19)=G:GOSUB 875
225  LET A(19)=J:GOSUB 875
230  LET A(19)=M:GOSUB 875
235  LET A(19)=Q:GOSUB 875
237  REM*WIN TEST*
238  IF A (18)=5 THEN GOTO 1000
240  PRINT"*":PRINT
242  PRINT"YOUR GUESS";
245  INPUT U
```

```
247    LET A(18)=0
248    REM* CHECK FOR CORRECT GUESS *
250    IF U=V THEN GOSUB 975
255    IF U=W THEN GOSUB 980
260    IF U=X THEN GOSUB 985
265    IF U=Y THEN GOSUB 990
270    IF U=Z THEN GOSUB 995
275    IF A(18)=0 THEN GOTO 290
280    LET B=A(15)
282    LET B=B+1
284    LET A(15)=B
286    A(B)=U
288    GOTO 140
290    LET B=A (17)
295    LET B=B+1
300    LET A (17)=B
305    GOTO 280
500    LET X=11:LET Y=12
502    LET Z=17:LET V=21
505    IF U=1 THEN LET W=15
510    IF U=2 THEN LET W=22
515    IF U=3 THEN LET W=18
520    GOTO 140
525    LET W =11:LET X=17
527    LET Y=13:LET Z=21
530    IF U=4 THEN LET V=14
535    IF U=5 THEN LET V=20
540    IF U=6 THEN LET V=22
545    IF U=7 THEN LET V=18
550    IF U=8 THEN LET V=12
555    GOTO 140
565    LET W=11: LET X=12
570    LET Y=17:LET Z=21
572    IF U=9 THEN LET V=15
575    IF U=10 THEN LET V=18
580    IF U=11 THEN LET V=20
585    IF U=12 THEN LET V=21
590    IF U=13 THEN LET V=22
595    GOTO 140
600    LET W=13:LET Z=11
605    LET Y=20:LET Z=21
607    IF U=14 THEN LET V=14
610    IF U=15 THEN LET V=15
615    IF U=16 THEN LET V=20
620    IF U=17 THEN LET V=21
625    IF U=18 THEN LET V=22
630    GOTO 140
```

```
635    LET W=16:LET X=23
637    LET Y=13:LET Z=21
640    IF U=19 THEN LET V=23
645    IF U=20 THEN LET V=22
650    IF U=21 THEN LET V=18
655    IF U=22 THEN LET V=14
660    GOTO 140
665    LET W=16:LET X=12
670    LET Y=17:LET Z=21
672    IF U=23 THEN LET V=17
675    IF U=24 THEN LET V=18
680    IF U=25 THEN LET V=22
685    GOTO 140
690    LET W=19:LET X=19
695    LET Y=17:LET Z=21
700    IF U=26 THEN LET V=12
702    IF U=27 THEN LET V=15
705    IF U=28 THEN LET V=18
710    GOTO 140
715    LET X=16: LET Y=12:LET Z=17
720    IF U>30 THEN GOTO 740
725    LET V=21:LET W=22
730    IF U=30 THEN LET W=18
735    GOTO 140
740    LET V=12:LET W=20
745    IF U=32 THEN LET V=22
750    GOTO 140
755    LET W=20:LET X=11
760    LET Y=12:LET Z=17
762    IF U=34 THEN LET V=12
765    IF U=35 THEN LET V=22
770    GOTO 140
775    LET X=11:LET Y=20:LET Z=21
780    IF U=36 THEN GOTO 790
785    LET V=21:LET W=22
787    GOTO 140
790    LET V=22:LET W=21
792    GOTO 140
795    LET V=21:LET W=22:LET X=11
797    LET Y=20:LET Z=22:GOTO 140
800    LET V=21:LET W=15
802    LET X=11:LET Y=14:LET Z=22
805    IF U=40 THEN LET X=16
810    GOTO 140
820    LET V=12:LET W=11:LET X=20
822    LET Y=13:LET Z=21:GOTO 140
```

```
825   LET V=13:LET W=20:LET X=20
827   LET Y=14:LET Z=20:GOTO 140
830   LET V=14:LET Y=22
832   IF U=43 GOTO 840
835   LET W=11:LET X=12
837   LET Z=12:GOTO 140
840   LET W=16:LET X=14
842   LET Z=15:GOTO 140
845   LET V=17:LET W=23:LET X=13
847   LET Y=13:LET Z=18:GOTO 140
850   LET V=18:LET W=16:LET X=17
852   LET Y=13:LET Z=21:GOTO 140
855   LET V=21
857   IF U=47 GOTO 865
860   LET W=17:LET X=16:LET Y=18
862   LET Z=18:GOTO 140
865   LET W=15:LET X=13:LET Y=11
867   LET Z=14:GOTO 140
870   LET W=15:LET X=13:LET Y=13
872   LET Z=14:GOTO 140
875   REM*CONVERSION TO LETTERS*
877   IF A(19)=0 GOTO 1015
880   IF A(19)=11 THEN PRINT"A";
885   IF A(19)=12 THEN PRINT"C";
890   IF A(19)=13 THEN PRINT"E";
895   IF A(19)=14 THEN PRINT"F";
900   IF A(19)=15 THEN PRINT"H";
905   IF A(19)=16 THEN PRINT"I";
910   IF A(19)=17 THEN PRINT"K";
915   IF A(19)=18 THEN PRINT"L";
920   IF A(19)=19 THEN PRINT"O";
925   IF A(19)=20 THEN PRINT"R";
930   IF A(19)=21 THEN PRINT"S";
935   IF A(19)=22 THEN PRINT"T";
940   IF A(19)=23 THEN PRINT"N";
942   LET A(18)=A(18)+1
945   RETURN
950   PRINT"HANGMAN":PRINT
955   PRINT" ","YOU LOSE"
957   PRINT:PRINT"THE WORD WAS ",
960   LET A(19)=V:GOSUB 875
962   LET A(19)=W:GOSUB 875
964   LET A(19)=X:GOSUB 875
966   LET A(19)=Y:GOSUB 875
968   LET A(19)=Z:GOSUB 875
```

```
 970  END
 975  LET D=V:LET A(18)=A(18)+1
 977  RETURN
 980  LET G=W:LET A(18)=A(18)+1
 982  RETURN
 985  LET J=X:LET A(18)=A(18)+1
 987  RETURN
 990  LET M=Y:LET A(18)=A(18)+1
 992  RETURN
 995  LET Q=Z:LET A(18)=A(18)+1
 997  RETURN
1000  PRINT" *":PRINT:PRINT
1005  PRINT"YOU WIN!"
1010  END
1015  PRINT"?";
1020  RETURN
```

TRS-80 BASIC

```
 10   A=11:C=12:E=13:F=14:H=15:I=16:K=17
 15   L=18:N=23:O=19:R=20:S=21:T=22:D=0
 20   G=0:J=0:M=0:Q=0
 25   F.X=1TO20:A(X)=0:N.X
 30   U=RND(50):IF U<4G.500
 35   IF U<9G.525
 40   IF U<14G.565
 45   IF U<19G.600
 50   IF U<23G.635
 55   IF U<26G.665
 60   IF U<29G.690
 65   IF U<33G.715
 70   IF U<36G.775
 80   IF U=38 G.795
 85   IF U<41G.800
 90   IF U=41G.820
 95   IF U=42G.825
100   IF U<45G.830
105   IF U=45G.845
110   IF U=46G.850
115   IF U<49G.855
120   V=22:IF U=49G.870
125   W=13:X=13:Y=22:Z=15
140   CLS:P." ","HANGMAN"
145   P."THESE LETTERS ARE NOT USED—B,D,G,J,M,Q,U,
      V,W,X,Y, & Z"
150   B=A(15):IF B=0G.165
155   P."LETTERS USED SO FAR—";
```

```
160   F.U=1TOB:A(19)=A(U):GOS.880:N.U
165   P.:P.:IF A(17)=0P."____"
170   IF A(17)=1P."H____"
175   IF A(17)=2P."HA____"
180   IF A(17)=3P."HAN____"
185   IF A(17)=4P."HANG____"
190   IF A(17)=5P."HANGM__"
195   IF A(17)=6P."HANGMA__"
200   IFA(17)=7G.950
210   P.:P.:P."","*";:A(18)=0
215   A(19)=D:GOS.875:A(19)=G:GOS.875
220   A(19)=J:GOS.875:A(19)=M:GOS.875
225   A(19)=Q:GOS.875:IFA(18)=5G.1000
240   P." *":P.
245   IN."YOUR GUESS";U:A(18)=0:IFU=VGOS.975
250   IF U=WGOS.980
255   IF U=XGOS.985
260   IF U=YGOS.990
265   IF U=ZGOS.995
270   IF A(18)=0G.290
275   B=A(15):B=B+1:A(15)=B:A(B)=U:G.140
290   A(17)=A(17)+1:G.275
500   X=11:Y=12:Z=17:V=21:IF U=1 THEN W=15
505   IF U=2 THEN W=22
510   IF U=3 THEN W=18
515   G.140
525   W=11:X=17:Y=13:Z=21:IF U=4 THEN V=14
530   IF U=5 THEN V=20
535   IF U=6 THEN V=22
540   IF U=7 THEN V=18
545   IF U=8 THEN V=12
550   G.140
565   W=11:X=12:Y=17:Z=21:IF U=9 THEN V=15
570   IF U=10 THEN V=18
575   IF U=11 THEN V=20
580   IF U=12 THEN V=21
585   IF U=13 THEN V=22
590   G.140
600   W=13:X=11:Y=20:Z=21:IF U=14 THEN V=14
605   IF U=15 THEN V=15
610   IF U=16 THEN V=20
615   IF U=17 THEN V=21
620   IF U=18 THEN V=22
625   G.140
635   W=16:X=23:Y=13:Z=21:IF U=19 THEN V=23
640   IF U=20 THEN V=22
```

```
645   IF U=21 THEN V=18
650   IF U=22 THEN V=14
655   G.140
665   W=16:X=12:Y=17:Z=21:V=22:IF U=23 THEN V=17
670   IF U=24 THEN V=18
680   G.140
690   V=12:W=19:X=19:Y=17:Z=21:IF U=27 THEN V=15
700   IF U=28 THEN V=18
710   G.140
715   X=16:Y=12:Z=17:IF U>30 G.740
720   V=21:W=22:IF U=30 THEN W=18
730   G.140
740   V=12:W=20:IF U=32 THEN V=22
750   G.140
755   V=12:W=20:X=11:Y=12:Z=17:IF U=35 THEN V=22
760   G.140
775   X=11:Y=20:Z=21:IF U=36 G.790
780   V=21:W=22:G.140
790   V=22:W=21:G.140
795   V=21:W=22:X=11:Y=20:Z=22:G.140
800   V=21:W=15:X=11:Y=14:Z=22:IF U=40 THEN X=16
810   G.140
820   V=12:W=11:X=20:Y=13:Z=21:G.140
825   V=13:W=20:X=20:Y=14:Z=20:G.140
830   V=14:Y=22:IF U=43 G.840
835   W=11:X=12:Z=21:G.140
840   W=16:X=14:Z=15:G.140
845   V=17:W=23:X=13:Y=13:Z=18:G.140
850   V=18:W=16:X=17:Y=13:Z=21:G.140
855   V=21:IF U=47 G.865
860   W=17:X=16:Y=18:Z=18:G.140
865   W=15:X=13:Y=11:Z=14:G.140
870   W=15:X=16:Y=13:Z=14:G.140
875   IF A(19)=0 G.1015
880   IF A(19)=11P."A";
885   IF A(19)=12 P."C";
890   IF A(19)=13 P."E";
895   IF A(19)=14P."F";
900   IF A(19)=15 P."H";
905   IF A(19)=16P."I";
910   IF A(19)=17P."K";
915   IF A(19)=18P."L";
920   IF A(19)=19P."O";
925   IF A(19)=20P."R";
930   IF A(19)=21P."S";
935   IF A(19)=22P."T";
```

```
940   IF A(19)=23P."N";
945   A(18)=A(18)+1:RET.
950   P."HANGMAN":P.:P."YOU LOSE":P.
955   P."THE WORD WAS ";:A(19)=V:GOS.875
960   A(19)=W:GOS.875:A(19)=X:GOS.875
965   A(19)=Y:GOS.875:A(19)=Z:GOS.875
970   END
975   D=V:A(18)=A(18)+1:RET.
980   G=W:A(18)=A(18)+1:RET.
985   J=X:A(18)=A(18)+1:RET.
990   M=Y:A(18)=A(18)+1:RET.
995   Q=Z:A(18)=A(18)+1:RET
1000  P." *":P.:P.:P."YOU WIN!:END
1015  P."?";:RET.
```

Summary Of Variables Used

A 11 * POSSIBLE LETTER
B Letter count
C 12 * POSSIBLE LETTER
D CORRECT GUESS * 1st POSITION
E 13 * POSSIBLE LETTER
F 14 * POSSIBLE LETTER
G CORRECT GUESS * 2nd POSITION
H 15 * POSSIBLE LETTER
I 16 * POSSIBLE LETTER
J CORRECT GUESS * 3rd POSITION
K 17 * POSSIBLE LETTER
L 18 * POSSIBLE LETTER
M CORRECT GUESS * 4th POSITION
N 23 * POSSIBLE LETTER
O 19 * POSSIBLE LETTER
P NOT USED
Q CORRECT GUESS * 5th POSITION
R 20 * POSSIBLE LETTER
S 21 * POSSIBLE LETTER
T 22 * POSSIBLE LETTER
U WORD SELECTION/CURRENT GUESS
V SECRET WORD * 1st LETTER
W SECRET WORD * 2nd LETTER
X SECRET WORD * 3rd LETTER
Y SECRET WORD * 4th LETTER
Z SECRET WORD * 5th LETTER
A(1)–A(11) LETTERS USED SO FAR
A(15) LETTER COUNT
A(17)–A(19) VARIABLES

Sample Run (excerpt)

HANGMAN
THESE LETTERS ARE NOT USED—B,D,G,J,M,Q,U,V,W,X,Y,&Z
LETTERS USED SO FAR—E A I S T
HAN____

*? A ? I ? *

YOUR GUESS? R

HANGMAN
THESE LETTERS ARE NOT USED—B,D,G,J,M,Q,U,V,W,X,Y, &Z
LETTERS USED SO FAR—E A I S T R
HAN____

*R A ? I ? *

YOUR GUESS? N

HANGMAN
THESE LETTERS ARE NOT USED—B,D,G,J,M,Q,U,V,W,X,Y, &Z
LETTERS USED SO FAR—E A I S T R N
HANG____

*R A ? I ? *

YOUR GUESS? O

Freebish!
The Game With Unknown Rules

Freebish! is probably the strangest game in this book, since part of the fun is the challenge of figuring out the rules. I recommend running the program a few times before reading the explanation (which is right after the program listings).

There are rules, even though it might not seem that way. Have fun, and if you get a little frustrated, try not to take it out on your computer. Just think of how much fun it will be when you get to watch someone else try to figure it out.

A sample run might give it away, so I'm not including one.

Standard BASIC

```
 2   FOR X=1 TO 40:PRINT
 4   NEXT X
 6   LET A=INT (RND(0)*21)-10
 8   LET B=INT(RND(0)*21)-10
10   LET C=INT(RND(0)*21)-10
12   LET D=INT(RND(0)*21)-10
14   LET E=INT(RND(0)*21)-10
16   LET F=INT(RND(0)*21)-10
18   LET G=INT(RND(0)*21)-10
20   LET H=INT(RND(0)*21)-10
22   LET I=INT(RND(0)*21)-10
24   LET J=INT(RND(0)*21)-10
26   LET K=INT(RND(0)*21)-10
28   LET L=INT(RND(0)*21)-10
30   LET M=INT(RND(0)*21)-10
32   LET N=INT(RND(0)*21)-10
34   LET Q=INT(RND(0)*21)-10
36   LET R=INT(RND(0)*21)-10
38   LET S=INT(RND(0)*21)-10
40   LET T=INT(RND(0)*21)-0
42   LET U=INT(RND(0)*21)-10
44   LET V=INT(RND(0)*21)-10
46   LET O=0:LET A(1)=0
48   LET W=0:LET A(2)=0
50   LET X=0:LET Z=0
52   LET A(3)=-50
54   REM* THE GAME BEGINS *
56   PRINT"FREEBISH!"
58   LET Y=F
60   LET A(2)=F
62   INPUT X
```

```
 64   GOSUB 180
 66   LET W=INT(RND(0)*20)+1
 68   IF W=1 THEN GOTO 225
 70   IF W=2 THEN GOTO 255
 72   IF W=3 THEN GOTO 270
 74   IF W=4 THEN GOTO 285
 76   IF W=5 THEN GOTO 300
 78   IF W=6 THEN GOTO 315
 80   IF W=7 THEN GOTO 330
 82   IF W=8 THEN GOTO 345
 84   IF W=9 THEN GOTO 360
 86   IF W=10 THEN GOTO 375
 88   IF W=11 THEN GOTO 390
 90   IF W=12 THEN GOTO 405
 92   IF W=13 THEN GOTO 420
 94   IF W=14 THEN GOTO 435
 96   IF W=15 THEN GOTO 450
 98   IF W=16 THEN GOTO 465
100   IF W=17 THEN GOTO 480
102   IF W=18 THEN GOTO 495
104   IF W=19 THEN GOTO 510
110   GOTO 525
160   LET A(2)=A(2)+Y
162   LET Z=0:LET W=0
164   LET A(1)=A(1)-(Y/2)
170   INPUT X
175   GOTO 64
180   IF X=A(3) THEN GOTO 220
185   IF X=Y THEN GOTO 220
187   LET A(1)=A(1)+X
190   LET A(3)=X
192   FOR Z=1 TO 470:NEXT Z
195   PRINT" SCORE"
197   PRINT"THE BRAIN",A(2)
200   PRINT"THE CLOD",A(1)
205   IF A(1)>35 THEN GOTO 550
208   IF A(2)>35THEN GOTO 540
210   PRINT:PRINT
212   FOR Z=1TO666:NEXT Z
215   LET Z=0
217   RETURN
220   LET A(1)=A(1)-10:FOR Z=1 TO 470:NEXT Z
222   GOTO 195
225   LET Z=A:GOSUB 240
227   IF Z=50 THEN GOTO 66
230   PRINT"ALBOOKISH!"
```

```
232  LET Y=A
235  GOTO 160
240  IF Z=Y THEN LET Z=50
245  IF Z=X THEN LET Z=50
250  RETURN
255  LET Z=B:GOSUB 240
257  IF Z=50 THEN GOTO 66
260  PRINT"BREEP!"
262  LET Y=B
265  GOTO 160
270  LET Z=C:GOSUB 240
272  IF Z=50 THEN GOTO 66
275  PRINT"CRIPKLUTS!"
277  LET Y=C
280  GOTO 160
285  LET Z=D:GOSUB 240
287  IF Z=50 THEN GOTO 66
290  PRINT"DUFFLEEM!"
292  LET Y=D
295  GOTO 160
300  LET Z=E:GOSUB 240
302  IF Z=50 THEN GOTO 66
305  PRINT"EXQUIMBLE!"
307  LET Y=E
310  GOTO 160
315  LET Z=F:GOSUB 240
317  IF Z=50 THEN GOTO 66
320  PRINT"FLIBBINK!"
322  LET Y=F
325  GOTO 160
330  LET Z=G:GOSUB 240
332  IF Z=50 THEN GOTO 66
335  PRINT"GRUNKITT!"
337  LET Y=G
340  GOTO 160
345  LET Z=H:GOSUB 240
347  IF Z=50 THEN GOTO 66
350  PRINT"HEEJAMBOONKIE!"
352  LET Y=H
355  GOTO 160
360  LET Z=I:GOSUB 240
362  IF Z=50 THEN GOTO 66
365  PRINT"ISTHRIM!"
367  LET Y=I
370  GOTO 160
375  LET Z=J:GOSUB 240
```

```
377   IF Z=50 THEN GOTO 66
380   PRINT"JACQUELPHLOOM!"
382   LET Y=J
385   GOTO 160
390   LET Z=K:GOSUB 240
392   IF Z=50 THEN GOTO 66
395   PRINT"KREECK!"
397   LET Y=K
400   GOTO 160
405   LET Z=L:GOSUB 240
407   IF Z=50 THEN GOTO 66
410   PRINT"LORKE!"
412   LET Y=L
415   GOTO 160
420   LET Z=M:GOSUB 240
422   IF Z=50 THEN GOTO 66
425   PRINT"MUCSTILE!"
427   LET Y=M
430   GOTO 160
435   LET Z=N:GOSUB 240
437   IF Z=50 THEN GOTO 66
440   PRINT"NEFLOM!"
442   LET Y=N
445   GOTO 160
450   LET Z=Q:GOSUB 240
452   IF Z=50 THEN GOTO 66
455   PRINT"QUIGGGLESBY!"
457   LET Y=Q
460   GOTO 160
465   LET Z=R:GOSUB 240
467   IF Z=50 THEN GOTO 66
470   PRINT"RECKLEBOP!"
472   LET Y=R
475   GOTO 160
480   LET Z=S:GOSUB 240
482   IF Z=50 THEN GOTO 66
485   PRINT"SNORK!"
487   LET Y=S
490   GOTO 160
495   LET Z=T:GOSUB 240
497   IF Z=50 THEN GOTO 66
500   PRINT"THUBBLE!"
502   LET Y=T
505   GOTO 160
510   LET Z=U:GOSUB 240
512   IF Z=50 THEN GOTO 66
```

```
515   PRINT"UBENZZERT!"
517   LET Y=U
520   GOTO 160
525   LET Z=V:GOSUB 240
527   IF Z=50 THEN GOTO 66
530   PRINT"VELK!"
532   LET Y=V
535   GOTO 160
540   PRINT"I WIN, "
542   GOSUB 570
545   PRINT"OF COURSE."
547   END
550   PRINT" HEY!      ";
552   GOSUB 570
555   PRINT"YOU WON!"
557   GOSUB 570
560   PRINT"THAT WASN'T SUPPOSED TO HAPPEN!"
565   END
570   FOR Z=1 TO 555
575   NEXT Z
580   RETURN
```

TRS-80 BASIC

```
 5    CLS:P.:P.:P.:A=RND(21)−11:B=RND(21)−11:C=RND(21)−11
10    D=RND(21)−11:E=RND(21)−11:F=RND(21)−11:G=RND(21)−11
15    H=RND(21)−11:I=RND(21)−11:J=RND(21)−11:K=RND(21)−11
20    L=RND(21)−11:M=RND(21)−11:N=RND(21)−11:Q=RND(21)−11
25    R=RND(21)−11:S=RND(21)−11:T=RND(21)−11:T=RND(21)−11
30    U=RND(21)−11:V=RND(21)−11:O=0:W=0:X=0:Z=0
35    A(1)=0:A(2)=0:A(3)=−50
40    P."FREEBISH!":Y=F:A(2)=F
45    IN.X:GOS.180:W=RND(20):IF W=1 G.225
50    IF W=2 G.255
55    IF W=3 G.270
60    IF W=4 G.285
65    IF W=5 G.300
70    IF W=6 G.315
72    IF W=7 G.330
74    IF W=8 G.345
76    IF W=9 G.360
78    IF W=10 G.375
80    IF W=11 G.390
82    IF W=12 G.405
84    IF W=13 G.420
86    IF W=14 G.435
88    IF W=15 G.450
```

38

```
 90   IF W=16 G.465
 92   IF W=17 G.480
 94   IF W=18 G.495
 96   IF W=19 G.510
100   G.525
160   A(2)=A(2)+Y:Z=0:W=0:A(1)=A(1)−(Y/2)
165   IN.X:G.50
180   IF X=A(3) G.220
185   IF X=Y G.220
190   A(1)=A(1)+X:A(3)=X:F.Z=1TO470:N.Z
195   P."SCORE":P."THE BRAIN",A(2):P."THE CLOD",A(1)
200   IF A(1)>35 G.550
205   IF A(2)>35 G.540
210   P.:P.:F.Z=1TO666:N.Z:Z=0:RET.
220   A(1)=A(1)−10:F.Z=1TO470:N.Z:G.195
225   Z=A:GOS.240:IF Z=50 G.55
230   P."ALBOOKISH!":Y=A:G.160
240   IF Z=Y THEN Z=50
245   IF Z=X THEN Z=50
250   RET.
255   Z=B:IF Z=50 G.55
260   Y=B:P."BREEP!":G.160
270   Z=C:GOS.240:IE Z=50 G.55
275   P."CRIPKLUTS!":Y=C:G.160
285   Z=D:GOS.240:IF Z=50 G.55
290   P.DUFFLEEM!":Y=D:G.160
300   Z=E:GOS.240:IF Z=50 G.55
305   P."EXQUIMBLE!":Y=E:G.160
315   Z=F:GOS.240:IF Z=50 G.55
320   P."FLIBBINK!":Y=F:G.160
330   Z=G:GOS.240:IF Z=50 G.55
335   P."GRUNKITT!":Y=G:G.160
345   Z=H:GOS.240:IF Z=50 G.55
350   P."HEEJAMBOONKLE!":Y=H:G.160
360   Z=I:GOS.240:IF Z=50 G.55
365   P."ISTHRIM!":Y=I:G.160
375   Z=J:GOS.240:IF Z=50 G.55
380   P."JACQUELPHLOOM!":Y=J:G.160
390   Z=K:GOS.240:IF Z=50 G.55
400   P."KREECK!":Y=K:G.160
405   Z=L:GOS.240:IF Z=50 G.55
410   P."LORKE!":Y=L:G.160
420   Z=M:GOS.240:IF Z=50 G.55
425   P."MUCSTILE!":Y=M:G.160
435   Z=N:GOS.240:IF Z=50 G.55
440   P."NEFLOM!":Y=N:G.160
```

```
450   Z=Q:GOS.240:IF Z=50 G.55
455   P."QUIGGLESBY!":Y=Q:G.160
465   Z=R:GOS.240:IF Z=50 G.55
470   P."RECKLEBOP!":Y=R:G.160
480   Z=S.GOS.240:IF Z=50 G.55
490   P."SNORK!":Y=S:G.160
495   Z=T:GOS.240:IF Z=50 G.55
500   P."THUBBLE!":Y=T:G.160
510   Z=U:GOS.240:IF Z=50 G.55
520   P."UBENZZERT!":Y=U:G.160
525   Z=V:GOS.240:IF Z=50 G.55
530   P."VELK!":Y=V:G.160
540   P."I WIN, ";:GOS.570
545   P."OF COURSE."
547   END
550   P."HEY! ";:GOS.570
555   P."YOU WON!":GOS.570
560   P."THAT WASN'T SUPPOSED TO HAPPEN!"
565   END
570   F.Z=1TO555:N.Z
575   RET.
```

The Rules for Freebish!

Actually the rules for Freebish! are really quite simple. Various letters of the alphabet (except O, W, X and Z, which are used by the computer to keep track of things) are randomly assigned values from −10 to +10. The first letter of any entry determines the amount to be added to or subtracted from your score (any additional letters are ignored; they're just for show). If you play the same letter twice in a row, or immediately after the computer has played that letter, you lose 10 points regardless of the ordinary point value of that letter. The computer chooses its plays randomly, but it won't break the repetition rule mentioned above, and its first play is always "FREEBISH!" (the letter F). Whoever manages to rack up a score of more than 35 points wins the game. Even when you know the rules, it's harder than it looks because the letters have different values each time you play. (NOTE: If two letters have the same point value, they are counted as the same letter for the repetition rule.)

Crops

In this game you are a farmer growing two crops—dreckmelons (which are delicious with rutabagas) and treephules, from which valuable treephule fibers are made. The object is to have a good harvest.

Dreckmelon plants will die if exposed to below 40° temperatures for too long. They can be kept warm by releasing strunkflies, which nest over dreckmelon plants in great droves, thereby keeping them warm. Unfortunately, strunkflies love to eat treephule bushes.

Nellum spiders eat strunkflies. Unfortunately, they also eat the frubees needed to pollenate the treephule bushes.

In case of drought you must open up irrigation ditches. But this will also bring in guntherbugs which destroy both crops (and bite people too). Guntherbugs serve no useful purpose.

To help you control the insect population, three different insecticides are available:

DDS: 13% effective against insects; 2½% effective against plants

RQL: 38% effective against insects; 27% effective against plants

MPN: 86% effective against insects; 58% effective against plants

You must balance the populations of these various insects for an optimum harvest. There is no all-purpose solution to this problem, because day-to-day weather will always have a changing effect. This means the game can be played over and over again, rather than being a repeatable puzzle. See Fig. 1-4 for the flowchart.

Standard BASIC

```
 5  PRINT:PRINT" ", "CROPS":PRINT
 7  LET A=0:LET B=0:LET C=0
10  REM* CROPS PLANTED *
12  LET D=500:LET T=500
14  REM* INITIAL INSECT POPULATION *
16  LET F=INT(RND(0)*500)+1:LET G=0
18  LET N=INT(RND(0)*500)+1:LET I=0
19  LET S=INT(RND(0)*500)+1:LET E=INT(RND(0)*100)-9
20  REM* DAY'S REPORT *
22  LET C=C+1
24  LET W=INT(RND(0)*10)+1
```

```
26   PRINT"YOU HAVE ";D;" DRECKMELON PLANTS, ";T;
28   PRINT"TREPHULE BUSHES",I;" IRRIGATION DITCHES"
30   PRINT:PRINT F;" FRUBEES",N;" NELLUM SPIDERS",
32   PRINT S;" STRUNKFLIES",G;" GUNTHERBUGS"
34   PRINT"DAY #";C,"TEMPERATURE ";E;" DEGREES",
36   IF E<40 THEN GOSUB 235
40   IF A>5 THEN GOTO 200
45   IF W>4 THEN GOTO 205
50   LET A=A+1
52   PRINT"DRY DAY":PRINT
54   LET E=E+INT(RND(0)*25)--11
56   LET X=RND(0)*F/1000
58   LET Y=T*X:LET T=T+INT(Y):LET D=D-INT(Y)
60   LET X=INT(RND(0)*S)+1
62   LET Y=INT(RND(0)*10)+5)
64   IF B>Y THEN GOSUB 220
66   LET X=X/1500
68   LET T=INT(T-(T*X))
70   LET X=(RND(0)*N)/5
72   LET S=S-INT(X) : LET F=F-INT(X)
74   G=G+(I*INT(RND(0)*100+1)
76   IF G<5 THEN GOTO 85
78   REM* LINES 55 TO 95 ARE CROP & INSECT ADJUST*
80   LET X=(INT(RND(0)*G+1))/20
82   LET D=D-INT(X)
84   LET X=(INT(RND(0)*G)+1)/20
86   LET T=T-INT(X):LET X=A-I
88   IF X>5 THEN GOSUB 260
90   LET X=C/20
92   IF X=INT(X) THEN GOTO 275
93   LET X=D+T
94   IF X<50 THEN GOTO 350
95   IF X>4000 THEN GOTO 370
96   REM* THE PLAY *
97   PRINT"1 TO RELEASE INSECTS. 2 TO SPRAY INSECTICIDE,"
98   LET G=INT(G+(G*.1)):LET F=INT(F+(F*.11))
99   LET S=INT(S+(S*.12)):LET N=INT(N+(N*.15))
100  PRINT"3 TO DIG IRRIGATION DITCH 4 TO CLOSE OLD"
102  PRINT"OLD DITCH OR 0 TO PASS"
104  INPUT L
106  IF L=1 THEN GOTO 300
108  IF L=2 THEN GOTO 125
110  IF L=3 THEN LET I=I+1
115  IF L=4 THEN LET I=I-1
117  IF I<1 THEN LET I=0
120  GOTO 20
125  REM* INSECTICIDE *
```
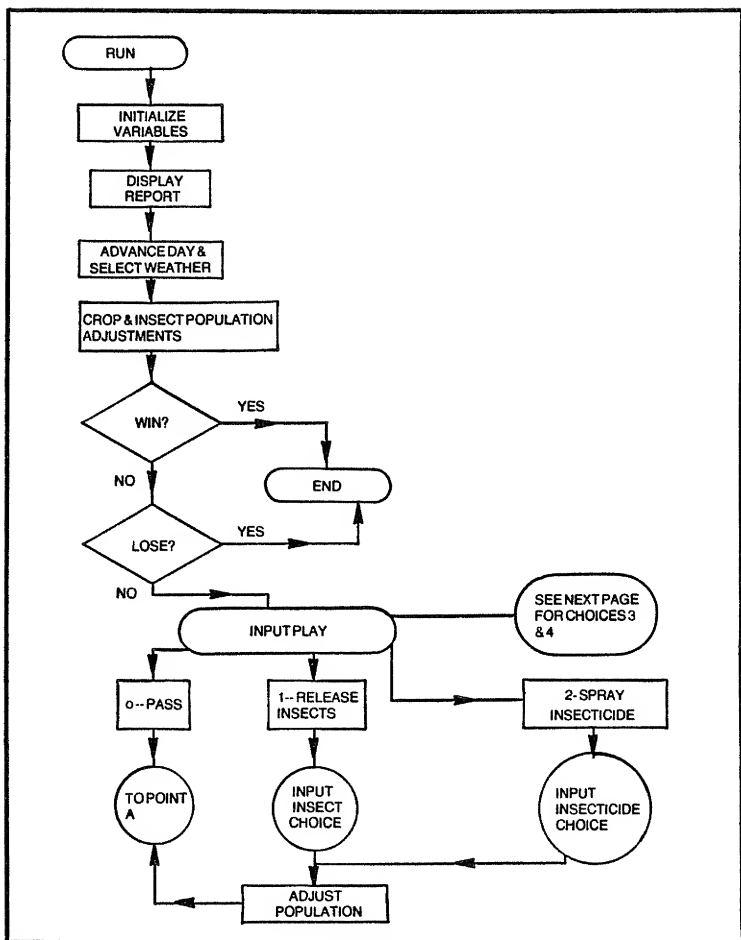
Fig. 1-4. Crops flowchart.

```
127   PRINT"1 FOR DDS, 2 FOR RQL, OR 3 FOR MPN"
130   INPUT L
132   IF L=1 THEN GOTO 160
135   IF L=2 THEN GOTO 180
137   REM* MPN EFFECTS *
140   LET D=INT(D-(D*.58))
142   LET T=INT(T-T*,58))
144   LET S=INT(S-S*.86))
146   LET N=INT(N-(N*.86))
148   LET F=INT(F-(F*.86))
150   LET G=INT(G-(G*.86))
155   GOTO 20
```

```
160   REM* DDS EFFECTS *
162   LET D=D-INT(D* .025)
164   LET T=T-INT(T*.025)
166   LET S=S-INT(S* .13)
168   LET N=N-INT(N*.13)
170   LET F=F-INT(F*.13)
172   LET G=G-INT(G*.13)
175   GOTO 20
180   REM* RQL EFFECTS *
182   LET D=D-INT(D*.27)
184   LET T=T-INT(T*.27)
186   LET S=S-INT(S*.38)
188   LET N=N-INT(N*.38)
190   LET F=F-INT(F*.38)
192   LET G=G-INT(G*.38)
195   GOTO 20
200   REM* RAIN SELECT *
202   IF W<7 THEN GOTO 50
205   PRINT "RAIN"
207   LET A=A-3
210   IF A<1 THEN LET A=0
215   GOTO 54
220   REM* WEATHER EFFECTS *
222   LET Z=INT (X/200)
224   IF D>Z THEN GOTO 230
226   LET D=INT(D-(RND(0)*D/6))
228   RETURN
230   LET D=INT(RND(0)*Z+2*(Z/3)
232   RETURN
235   LET B=B+1
240   IF E<20 THEN LET B=B+.5
245   IF E<10 THEN LET B=B+.75
250   IF E<0 THEN LET B=B+1
255   RETURN
260   REM * DROUGHT DAMAGE *
262   LET J=(INT(RND(0)*100)+1)/100
264   LET K=(INT(RND(0)*100)+1)/100
266   LET D=D-(J*D)
268   LET T=T-(T*K)
270   LET D=INT(D):LET T=INT(T)
272   RETURN
275   REM* CROP GROWTH *
280   LET Y=D*1.5
285   LET D=D+INT(RND(0)*Y+1)
290   LET Y=T*1.5
292   LET T=T+INT(RND(0)*Y-1)
295   RETURN
```

44

```
300  PRINT"1 FOR STRUNKFLIES, 2 FOR NELLUM SPIDERS, 3"
305  PRINT"FOR FRUBEES, OR 4 FOR GUNTHERBUGS"
307  INPUT X
310  PRINT"HOW MANY ";
312  INPUT Y
315  IF Y<0 THEN LET Y=0-Y
317  LET Y=INT(Y)
320  IF X=4 THEN GOTO 340
322  IF X=1 THEN LET S=S+Y
325  IF X=2 THEN LET N=N+Y
330  IF X=3 THEN LET F=F+Y
335  GOTO 20
340  PRINT"WHY WOULD YOU WANT ";Y;" MORE
     GUNTHER BUGS!?"
342  LET G=G+Y
345  GOTO 20
350  REM* LOSE *
352  PRINT"YOU'VE SUCCEEDED IN KILLING OFF MOST OF
     YOUR"
355  PRINT"CROPS. YOU'RE DOWN TO ";D;"DRECKMELON
     PLANTS"
360  PRINT"AND ";T;" TREPHULE BUSHES"
362  PRINT
365  PRINT"WHAT A LOUSY FARMER!"
367  END
370  PRINT" WOW!"
375  PRINT"YOU HAVE ";D;" DRECKMELON PLANTS AND"
380  PRINT T;" TREPHULE BUSHES"
385  PRINT
390  REM * WIN*
395  PRINT"YOU DESERVE AN AWARD IN AGRICULTURE!"
400  END
```

TRS-80 BASIC

```
  5  CLS:P." ","CROPS":P.:A=0
 10  B=0:C=0:D=500:F=RND(500):G=0
 15  I=0:N=RND(500):S=RND(500):T=500:E=RND(100)-10
 20  C=C+1:W=RND(10)
 25  P."YOU HAVE ";D;" DRECKMELON PLANTS, ";T;
 30  P."TREPHULE BUSHES",I;" IRRIGATION DITCHES":P.
 32  P.F.;"FRUBEES ",N;"NELLUM SPIDERS",S;"
     STRUNKFLIES",
 34  P.G.;"GUNTHERBUGS":P."DAY #";C,"TEMPERATURE"
     ;E;"DEGREES",
 36  IF E<40 GOS.235
 40  IF A>5 G.200
 45  IF W>4 G.205
```

```
50   A=A+1:P."DRY DAY":P.
55   E=E+RND(25)−12:X=RND(F)/1000:Y=T*X:T=T+INT(Y)
     :D=D− IN+(Y)
60   X=RND(S) :Y=RND(10)+4:IF B>Y GOS.220
65   X=X/1500:T=INT(T−(T*X))
70   X=RND(N)/5:S=S−INT(X):G=G+(I*RND(100)):F=F−INT(X)
75   IF G<5 G.85
80   X=INT(RND(G)/20):D=D−X:X=INT(RND(G)/20):T=T−X
85   X=A−I:IF X>5 GOS.260
90   X=C/20:IF X=INT(X) G.275
92   X=D+T:IF X<50 G.350
93   IF X>4000 G.370
95   P."1 TO RELEASE INSECTS, 2 TO SPRAY INSECTICIDE, 3"
97   G=INT(G+(G*.1)):F=INT(F+(F*.11)):S=INT(S+(S*.12))
98   N=N+INT(X*.15)
100  P."TO DIG IRRIGATION DITCH, 4 TO CLOSE OLD DITCH,"
102  IN."OR 0 TO PASS      ";L
105  IF L=1 G.300
110  IF L=2 G.125
115  IF L=3 THEN I=I+1
117  IF L=4 THEN I=I−1
118  IF I<1 THEN I=0
120  G.20
125  IN."1 FOR DDS, 2 FOR RQL OR 3 FOR MPN ";L
130  IF L=1 G.160
135  IF L=2 G.180
140  D=INT(D−(D*.58)):T=T−INT(T*.58)
145  S=S−(INT(S*.86)):N=N−INT(N*.86)
150  F=F−INT(F*.86):G=INT(G−(G*.86)
155  G.20
160  D=D−INT(D*.025):T=T−INT(T*.025)
165  S=S−INT(S*.13):N=N−INT(N*.13)
170  F=F−INT(F*.13):G=G−INT(G*.13)
175  G.20
180  D=D−INT(D*.27):T=T−INT(T*.27)
185  S=S−INT(S*.38):N=INT(N−(N*.38))
190  F=F−INT(F*.38):G=G−INT(G*.38)
195  G.20
200  IF W<7 G.50
205  P."RAIN":A=A−3
210  IF A<1 THEN A=0
215  G.55
220  Z=INT(X/200):IF D<Z G.230
225  D=INT(D−RND(D/6)):RET.
230  D=INT(RND(Z/3)+2*(Z/3)):RET.
235  B=B+1
240  IF E<20 THEN B=B+.5
```

```
245  IF E<10 THEN B=B+.75
250  IF E<0 THEN B=B+1
255  RET.
260  J=RND(100)/100:K=RND(100)/100
265  D=INT(D-(J*D)):T=INT(T-(T*K))
270  RET.
275  D=D+INT(D*1.5):T=T+INT(T*1.5)
280  RET.
300  P."1 FOR STRUNKFLIES, 2 FOR NELLUM SPIDERS, 3"
305  P."FOR FRUBEES, OR 4 FOR GUNTHERBUGS"
307  IN.X
310  IN."HOW MANY";Y:Y=INT(Y)
315  Y=ABS(Y):IF X=4 G.340
320  IF X=1 THEN S=S+Y
325  IF X=2 THEN N=N+Y
330  IF X=3 THEN F=F+Y
335  G.20
340  P."WHY WOULD YOU WANT";Y;" MORE GUNTHERBUGS?!?"
345  G=G+Y:G.20
350  P."YOU'VE SUCCEEDED IN KILLING OFF MOST OF YOUR"
355  P."CROPS. YOU'RE DOWN TO ";D;"DRECKMELON PLANTS"
360  P."AND ";T;" TREPHULE BUSHES":P.
365  P."WHAT A LOUSY FARMER!":END
370  P."WOW!"
375  P."YOU HAVE ";D;"DRECKMELON PLANTS AND ";T
380  P."TREPHULE BUSHES"
385  P.:P."YOU DESERVE AN AWARD IN AGRICULTURE!"
390  END
```

Summary of Variables Used

A   Number of dry days
B   Number of cold days
C   Day number
D   Number of dreckmelon plants
E   Temperature
F   Number of frubees
G   Number of guntherbugs
I   Number of irrigation ditches
J   Various calculations
K   Various calculations
N   Number of nellum spiders
S   Number of strunkflies
T   Number of trephule bushes
W   Rain or dry
X   Various calculations
Y   Various calculations
Z   Various calculations

H, M, O, P, Q, and R are not used in this program.

YOU HAVE 500 DRECKMELON PLANTS, 500
TREPHULE BUSHES, 0 IRRIGATION DITCHES,
397 FRUBEES, 284 NELLUM SPIDERS, 152 STRUNKFLIES,
0 GUNTHERBUGS
DAY #1   TEMPERATURE   70 DEGREES
RAIN
1 TO RELEASE INSECTS, 2 TO SPRAY INSECTICIDE, 3
TO DIG IRRIGATION DITCH, 4 TO CLOSE OLD DITCH,
OR 0 TO PASS ?2
1 FOR DDS, 2 FOR RQL, OR 3 FOR MPN? 2
YOU HAVE 365 DRECKMELON PLANTS, 451
TREPHULE BUSHES, 0 IRRIGATION DITCHES,
273 FRUBEES, 203 NELLUM SPIDERS, 94 STRUNKFLIES,
0 GUNTHERBUGS
DAY #2   TEMPERATURE 68 DEGREES
DRY DAY
1 TO RELEASE INSECTS, 2 TO SPRAY INSECTICIDE, 3
TO DIG IRRIGATION DITCH, 4 TO CLOSE OLD DITCH,
OR 0 TO PASS ?1
1 FOR STRUNKFLIES, 2 FOR NELLUM SPIDERS, 3
FOR FRUBEES, OR 4 FOR GUNTHERBUGS
?1
HOW MANY? 100
YOU HAVE 332 DRECKMELON PLANTS, 503
TREPHULE BUSHES, 0 IRRIGATION DITCHES,
303 FRUBEES, 233 NELLUM SPIDERS, 187 STRUNKFLIES
0 GUNTHERBUGS
DAY #3   TEMPERATURE 77 DEGREES
DRY DAY
1 TO RELEASE INSECTS, 2 TO SPRAY INSECTICIDE, 3
TO DIG IRRIGATION DITCH, 4 TO CLOSE OLD DITCH,
OR 0 TO PASS ?3
YOU HAVE 299 DRECKMELON PLANTS, 567
TREPHULE BUSHES, 1 IRRIGATION DITCHES,
296 FRUBEES, 267 NELLUM SPIDERS, 169 STRUNKFLIES
0 GUNTHERBUGS
DAY #4   TEMPERATURE 69 DEGREES
RAIN
1 TO RELEASE INSECTS, 2 TO SPRAY INSECTICIDE, 3
TO DIG IRRIGATION DITCH, 4 TO CLOSE OLD DITCH,
OR 0 TO PASS ?2
1 FOR DDS, 2 FOR RQL, OR 3 FOR MPN? 3
YOU HAVE 91 DRECKMELON PLANTS, 257
TREPHULE BUSHES, 1 IRRIGATION DITCHES,
36 FRUBEES, 38 NELLUM SPIDERS, 19 STRUNKFLIES,
14 GUNTHERBUGS
DAY #5   TEMPERATURE 61 DEGREES
RAIN

There's Gold
In Them There Skyscrapers

The directions for playing this game are included in the program listing, steps 450 to 520. You may omit these steps from the program along with steps 15, 20, and 525 to 575 if you want to save program space.

The building layout is included in the array. A(1) to A(100) are set to 0,2,3, or 4. Obviously each array position stands for a room. If a given array position is equal to 2, that's the room holding the gold. This can be any room from #2 to #100 (step 145). Room #1 is the room the game starts in, but it would be a very short game if the gold was found there.

If the array position is equal to 3 that room has an exit from the building. Three of the rooms from 1 to 10 have an exit. These are designated as the ground floor since an exit on the 8th floor wouldn't be too good an idea.

Any of the upper rooms (from 11 to 100) might have a trap door (designated by a 4 in the array position). If you enter one of these rooms, you will fall to the room immediately below it. For example, room 73 would drop you to room 63. Since each array position can hold only one number, the gold won't be in a room with a trap door.

A zero in the array position is just a space holder with no particular meaning.

If the room has the appropriate doors, you can move to the room on the immediate right, left, above or below the room you're in. The doors are set in array positions A(101) to A(500). A(101) to A(200) determine which rooms have doors to the right (room 38 would correspond to A(138). A(201) to A(300) are the doors to the left. A(301) to A(400) are the doors to the rooms above, and A(401) to A(500) are the doors to the rooms below. A 1 in any given array position indicates the presence of that particular door, while a 0 signifies its absence. (NOTE: you can't always get out of a room the way you came in).

In step 30 all the doors are set to 1, then the impossible doors are removed (steps 40 to 60). These are the doors along the perimeter of the building. There is no room to the left of room 41, for instance, so there shouldn't be a door there, either.

Finally up to 250 of the remaining 360 doors are randomly moved. It's theoretically possible for you to find yourself in a room with no doors at all. If this happens you have to hit the 'BREAK' key

to get out of the dead-ended program. I haven't included any protection against this kind of thing because it would take a great deal of program space, and the odds are the problem will never come up anyway. It's possible, but unlikely.

Your moves are limited to Right, Left, Up, Down, or Exit (you can use just the first letters or type out the entire word). Any other entry is an invalid move, but the number of moves will still be incremented by 1, worsening your score. If you try to use a door that isn't there, you'll receive the error message from step 355, and it will be treated as an invalid move.

The only way to end the game is to either BREAK the program, or leave the building via one of the exits either with the gold (you win) or empty-handed (you lose). After playing a few games you can determine for yourself what kind of score to consider "par." I've seen scores of 150 add up in this game, and once I lucked out and left with the gold in a mere 5 moves.

You can alter the odds by changing step 75. This step begins with the command Y=RND(250). Y is the number of doors to be randomly removed (the number might be reduced if the computer decides to remove certain doors more than once). If you want an easier game you can change this command to Y=RND(100). Or you might try Y=RND(150)+150. There could be up to 300 doors removed (out of 360!), and at least 150 will be removed (except where the computer gets redundant and gives you a break). If you alter this command, be sure to re-enter the rest of step 75 as it is written in the original program. See Fig. 1-5 for the flowchart.

Standard BASIC

```
 5   CLS:PRINT:FOR X=1 TO 100: LET A(X)=0:NEXT X
10   PRINT"     GOLD IN THEM THERE SKYSCRAPERS"
15   INPUT"ENTER 1 FOR INSTRUCTIONS OR 2 FOR GAME ";X
20   IF X=1 GOTO 450
25   REM ** PUT DOORS IN ALL ROOMS
30   FOR X=101 TO 500:LET Z(X)=1:NEXT X
35   REM ** REMOVE IMPOSSIBLE DOORS
40   FOR X=391 TO 410: LET A(X)=0:NEXT X
45   LET Y=201:FOR X= 1 TO 10
50   LET A(Y)=0:LET Y=Y+10:NEXT X
60   LET Y=110:FOR X=1TO 10
65   LET A(Y)=0:LET Y=Y+10:NEXT X
70   REM ** REMOVE RANDOM DOORS
75   LET Y=INT(RND(1)*250)+1
80   FOR X= 1 TO Y:LET Z=INT(RND(1)*400)+101
90   LET A(Z)=0:NEXT X
```

```
100   REM ** PLANT TRAP DOORS
105   LET Y=INT(RND(1)*20)+1
110   FOR X=1 TO Y:LET Z=INT(RND(1)*90)+11
120   LET A(Z)=4:NEXT X
125   REM ** PLANT EXITS & GOLD
```
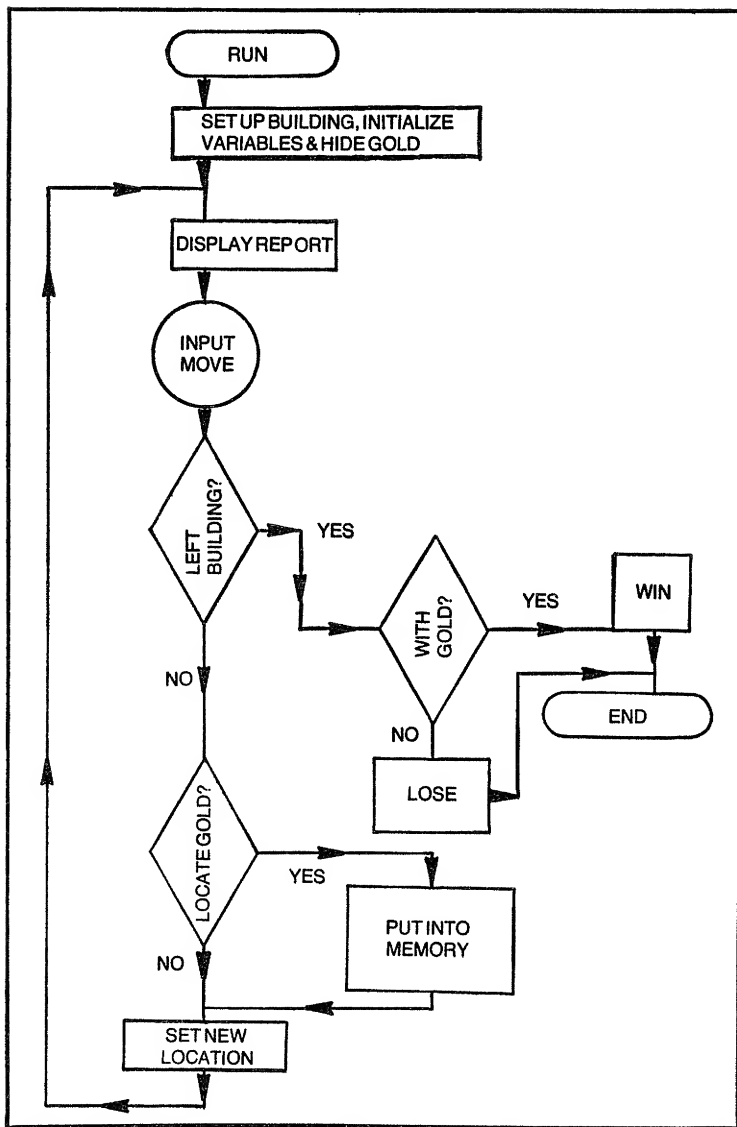

Fig. 1-5. Flowchart for There's Gold in Them There Skyscrapers.

```
130   FOR X=1 TO 3:LET Y=INT(RND(1)*10)+1
135   LET A(Y)=3:NEXT X
140   LET X=INT(RND(1)*99)+2:LET A(X)=2
150   REM ** SET GAME VARIABLES
155   LET M=1: LET P=1:LET G=0
160   LET E=20:LETU=10:LET D=-10
170   LET R=1:LET L=-1
200   PRINT"MOVE #";M:LET M=M+1
205   PRINT"YOU ARE IN ROOM #";P
210   LET X=A(P)
215   IF X=2 GOSUB 400
220   IF X=3 PRINT"THERE IS AN EXIT."
225   IF X=4 GOTO 420
230   PRINT"YOU CAN MOVE IN THE FOLLOWING DIRECTIONS
      ---"
235   LET Y=P+100:IF A(Y)=1PRINT"RIGHT ";
240   LET Y=P+200:IF A(Y)=1 PRINT"LEFT ";
245   LET Y=P+300:IF A(Y)=1 PRINT"UP ";
250   LET Y=P+400:IF A(Y)=1 PRINT"DOWN ";
255   PRINT:PRINT
260   INPUT"YOUR MOVE";Q
265   IF Q=E GOTO 300
270   IF Q=R GOTO 340
275   IF Q=L GOTO 370
280   IF Q=U GOTO 380
285   IF Q=D GOTO 390
290   PRINT "INVALID MOVE!"
295   GOTO 200
300   IF A(P)=E GOTO 310
305   GOTO 290
310   PRINT "YOU HAVE JUST LEFT THE BUILDING WITH";
315   IF G=0 PRINT"OUT";
320   PRINT "THE GOLD."
325   LET M=M-1
330   PRINT "IT TOOK YOU ";M;" MOVES."
335   END
340   REM ** MOVE = RIGHT
345   LET X=P+100
350   IF A(X)=1 GOTO 365
355   PRINT"YOU JUST RAN INTO A WALL, CLOD!"
360   GOTO 200
365   LET P=P+Q:GOTO 200
370   REM ** MOVE = LEFT
375   LET X=P+200:GOTO 350
380   REM ** MOVE = UP
385   LET X=P+300:GOTO 350
390   REM ** MOVE = DOWN
```

52

```
395   LET X=P+400:GOTO 350
400   PRINT "YOU JUST FOUND THE GOLD!"
405   LET A(P)=0: LET G=1
410   RETURN
420   PRINT"TRAP DOOR!"
425   LET P=P−10
430   FOR X=1TO 333: NEXT X
440   GOTO 200
```

Secret Passageway Option (Standard BASIC)

```
122   LET Y=INT(RND(1)*40)+1:FOR X=1TO Y
123   LET Z=INT(RND(1)*100)+1
124   LET A(Z)=5:NEXT X:LET S=5
227   IF X=5 PRINT "THERE IS A SECRET PASSAGEWAY"
287   IF Q=S GOTO 600
600   IF A(P)=5 GOTO 620
610   GOTO 290
620   CLS:LET P=INT(RND(1)*100)+1
630   FOR X=1 TO 456: NEXT X
640   GOTO 200
```

TRS-80 BASIC

```
10    CLS:P. :P." ","GOLD IN THEM THERE SKYSCRAPERS"
15    F.X=101TO500:A(X)=1:N.X:F.X=1TO100:A(X)=0N.X
20    F.X=391TO410:A(X)=0:N.X:Y=201:F.X=TO10
25    A(Y)=0:Y=Y+10:N.X:Y=110:F.X=1TO10
30    A(Y)=0:Y=Y+10:N.X
40    Y=RND(250):F.X=1TOY:Z=RND(400)+100
45    A(Z)=0:N.X:M=1:P=1:G=0:E=20
50    Y=RND(20):F.X=1TOY:Z=RND(90)+10:A(Z)=4:N.X
55    U=110:D=−10:R=1:L=−1:F.X=1TO3:Y=RND(10)
60    A(Y)=3:N.X:X=RND(99)+1:A(X)=2
100   P."MOVE #";M:M=M+1:P."YOU ARE IN ROOM #";P
105   X=A(P):IF X=2 GOS.250
110   IF X=3 P."THERE IS AN EXIT."
115   IF X=4 G.260
120   P."YOU CAN MOVE IN THE FOLLOWING DIRECTIONS ---"
125   Y=P+100:IF A(Y)=1 P."RIGHT ";
1300  Y=P+200:IF A(Y)=1 P."LEFT ";
135   Y=P+300:IF A(Y)=1 P."UP ";
140   Y=P+400:IF A(Y)=1 P."DOWN ";
145   P.:P.:IN."YOUR MOVE";Q:IF Q=E G.180
150   IF Q=R G.210
155   IF Q=L G.230
160   IF Q=U G.235
```

53

```
165  IF Q=D G.240
170  P."INVALID MOVE!":G.100
180  IF A(P)=E G.190
185  G.170
190  P."YOU HAVE JUST LEFT THE BUILDING WITH";
195  IF G=0 P."OUT";
200  P."THE GOLD."M=M-1:P."IT TOOK YOU ";M;" MOVES.'
205  END
210  X=P+100
215  IF A(X)=1 G.225
220  P."YOU JUST RAN INTO A WALL, CLOD!":G.100
225  P=P+Q:G.100
230  X=P+200:G.215
235  X=P+300:G.215
240  X=P+400:G.215
250  P."YOU FOUND THE GOLD!":A(P)=0:G=1:RET.
260  P=P-10:P."TRAP DOOR!":F.X=1TO 333:N.X:G.100
```

Secret Passageway Option (TRS-80)

```
 35  Y=RND(40):F.X=1TOY:Z=RND(100):A(Z)=5:N.X:S=5
117  IF X=S GOS.300
167  IF Q=S G.310
300  P."THERE IS A SECRET PASSAGEWAY";RET.
310  IF A(P)=5G,620
315  G.170
320  CLS:P=RND(100):F.X=1TO456:N.X
330  G.100
```

Summary Of Variables Used

D   Move down. D= -10
E   Exit. E=20
G   Gold located?
L   Move left. L = -1
M   Move #
P   Current room
Q   Current move
R   Move right. R = 1
U   Move up. U = 10
X   Set-up & timing variable
Y   "
Z   "

Sample Run (Excerpt)

GOLD IN THEM THERE SKYSCRAPERS

MOVE #1
YOU ARE IN ROOM #1

54

YOU CAN MOVE IN THE FOLLOWING DIRECTIONS ---
RIGHT UP
YOUR MOVE? RIGHT
MOVE #2
YOU ARE IN ROOM #2
THERE IS AN EXIT
YOU CAN MOVE IN THE FOLLOWING DIRECTIONS ---
LEFT UP
YOUR MOVE? UP
MOVE #3
YOU ARE IN ROOM #12
YOU CAN MOVE IN THE FOLLOWING DIRECTIONS ---
RIGHT LEFT UP DOWN
YOUR MOVE? RIGHT
MOVE #4
YOU ARE IN ROOM #13
YOU CAN MOVE IN THE FOLLOWING DIRECTIONS ---
RIGHT LEFT DOWN
YOUR MOVE? RIGHT
MOVE #5
YOU ARE IN ROOM #14
TRAP DOOR!
MOVE #6
YOU ARE IN ROOM #4
THERE IS AN EXIT
YOU CAN MOVE IN THE FOLLOWING DIRECTIONS ---
RIGHT LEFT UP
YOUR MOVE? EXIT
YOU HAVE JUST LEFT THE BUILDING WITHOUT THE GOLD
IT TOOK YOU 6 MOVES

Lost In The Jungle

This is an adventure game of the type increasingly popular among computer hobbyists. The player has an objective (getting out of the jungle alive) and the computer offers various obstacles to the goal (wolves, lions, black widow spiders, waterholes, quicksand, poisonous berries). The player is then offered a series of options to select from. The computer analyzes the results of each choice, usually with an element of weighted randomness. On each move the player moves one mile in any of the four basic directions (north, south, east, or west).

An added trick to this game is the main scoring variables (distance to the outside of the jungle, and the player's remaining strength). If you're not careful you may suddenly find yourself dropping from exhaustion. You can build up your level of strength by eating, but watch out! Some of the food you'll come across might turn out to be tainted.

If you get close to the edge of the jungle you'll be told you can see light through the trees ahead.

Unlike many adventure games, the obstacles are randomly placed and the solutions are randomly weighted to keep the game interesting even after you've played it a number of times. See Fig. 1-6 for the flowchart.

Standard Basic

```
 2  LET A=11:LET B=12
 4  LET C=13:LET D=14
 6  LET E=25:LET M=20
 8  LET H=12:LET K=100
10  LET F=INT(RND(0)*50)+21
18  PRINT:PRINT
20  PRINT" ","LOST IN THE JUNGLE":PRINT
22  OGSUB 500
25  PRINT"YOU ARE LOST IN A JUNGLE. YOU HAVE A GUN
    WITH 6"
30  PRINT"BULLETS, A KNIFE,& A SLINGSHOT. THE TRICK IS
    TO"
35  PRINT"FIND YOUR WAY BACK TO CIVILIZATION WITHOUT
    GETTING"
40  PRINT"YOURSELF KILLED. EACH MOVE IS ONE MILE. THE
    JUNGLE"
```

```
45    PRINT"IS 100 MILES SQUARE. PRESS 'ENTER' TO START"
50    INPUT A$
55    PRINT"DO YOU WANT AN EASY, MEDIUM OR HARD
      GAME";
60    INPUT J
62    LET H=INT(RND(0)*50)+21
64    LET G=100-F:LET I=100-H:LET M=6
65    REM* BEGIN GAME*
70    GOSUB 1000
72    LET Z=X:LET S=J-4
74    REM* EVENT SELECTION*
76    LET Y=INT(RND(0)*S)+1
78    GOSUB 500
80    IF Y=1 THEN GOTO 150
82    IF Y<4 THEN GOTO 225
85    IF Y=4 THEN GOTO 520
90    IF Y=6 THEN GOTO 520
95    IF Y=7 THEN GOTO 105
100   GOTO 70
105   PRINT"YOU COME TO A BUSH OF BERRIES"
107   LET Y=17:LET N=18
110   PRINT"DO YOU EAT THEM?";
112   INPUT Q
115   IF Q=17 THEN GOTO 122
117   REM* NOT EAT BERRIES*
120   GOTO 70
122   REM*EAT BERRIES*
124   LET K=K+(J/10)
126   LET L=INT(RND(0)*J)+1
128   IF L<(J*.75) THEN GOTO 140
130   PRINT"THEY MAKE YOU QUITE ILL"
132   LET K=K-INT(RND(0)*K)
135   GOTO 70
140   REM*BERRIES OK*
142   LET K=K+(J/10)
145   GOTO 70
150   PRINT"YOU STEP INTO QUICKSAND!"
152   GOSUB 500
154   PRINT"WHAT DO YOU DO?"
156   PRINT A — TRY TO CLAW YOUR WAY OUT"
158   PRINT"B — GIVE UP"
160   PRINT"C — GRAB ONTO A TREE BRANCH"
162   PRINT"D — START PRAYING"
165   INPUT X
170   IF X=C THEN GOTO 200
180   PRINT"SORRY      ";
```
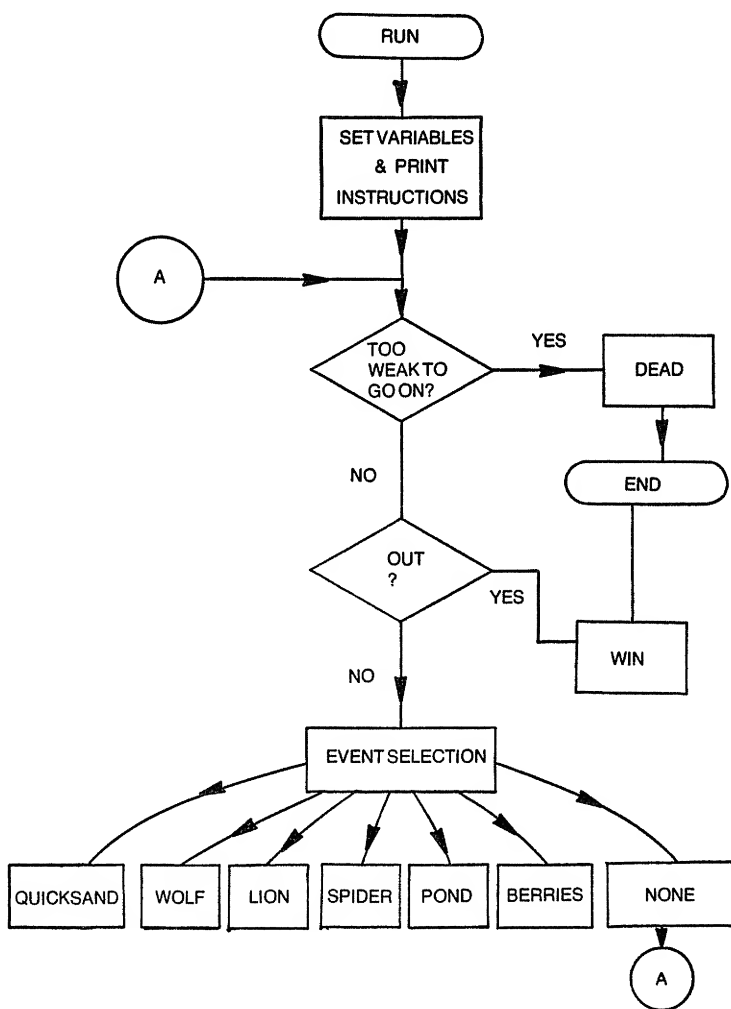
Fig. 1-6. Flowchart for Lost in the Jungle.
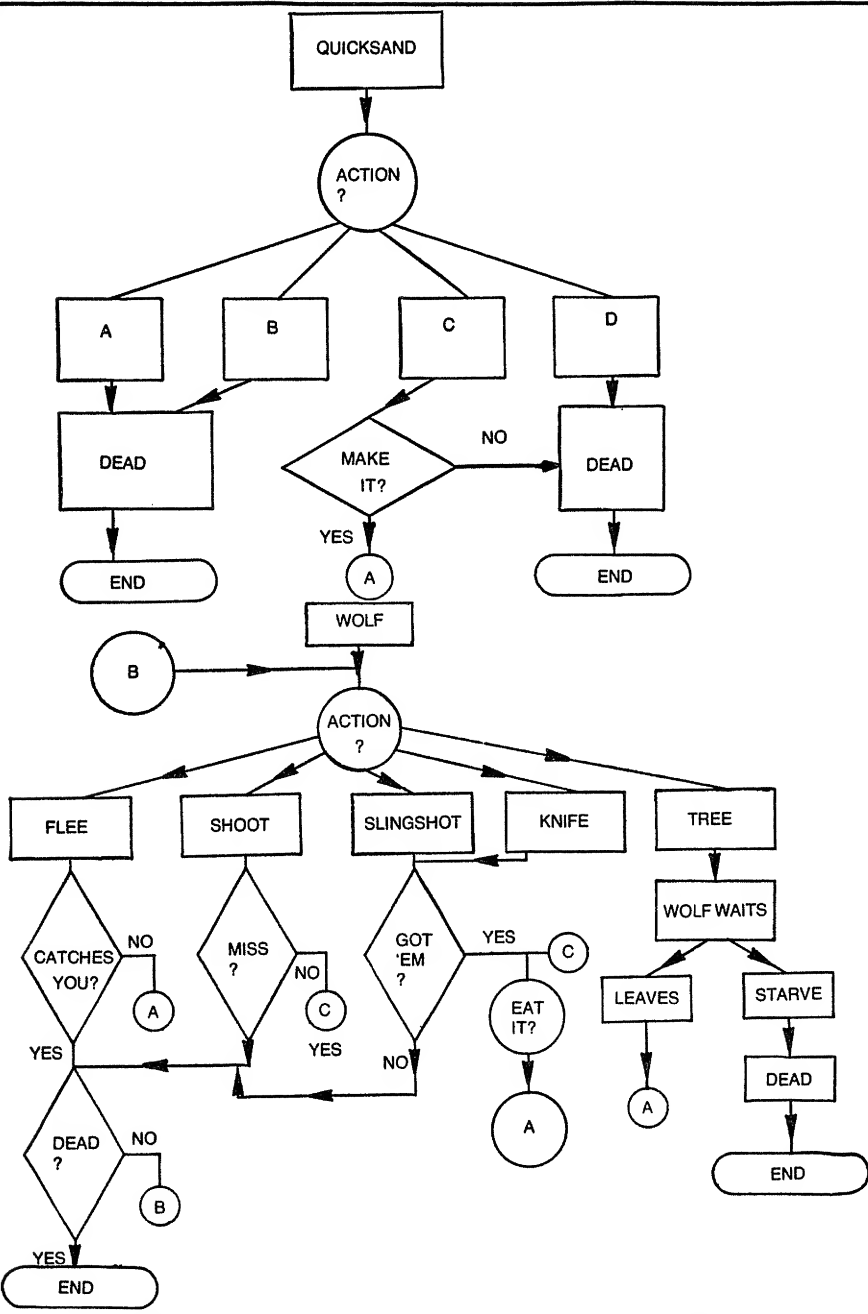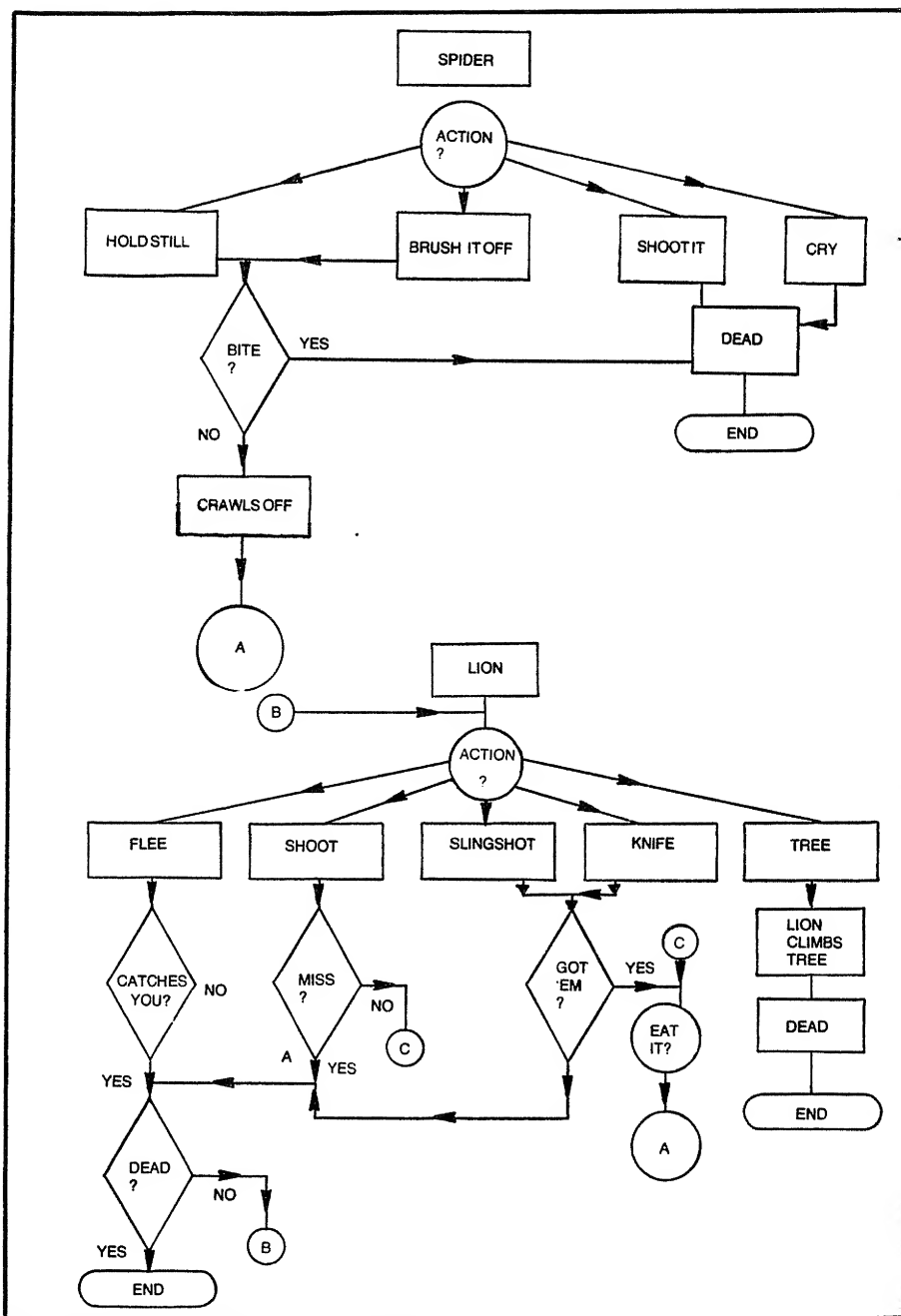
Fig. 1-6. Flowchart for Lost in the Jungle.
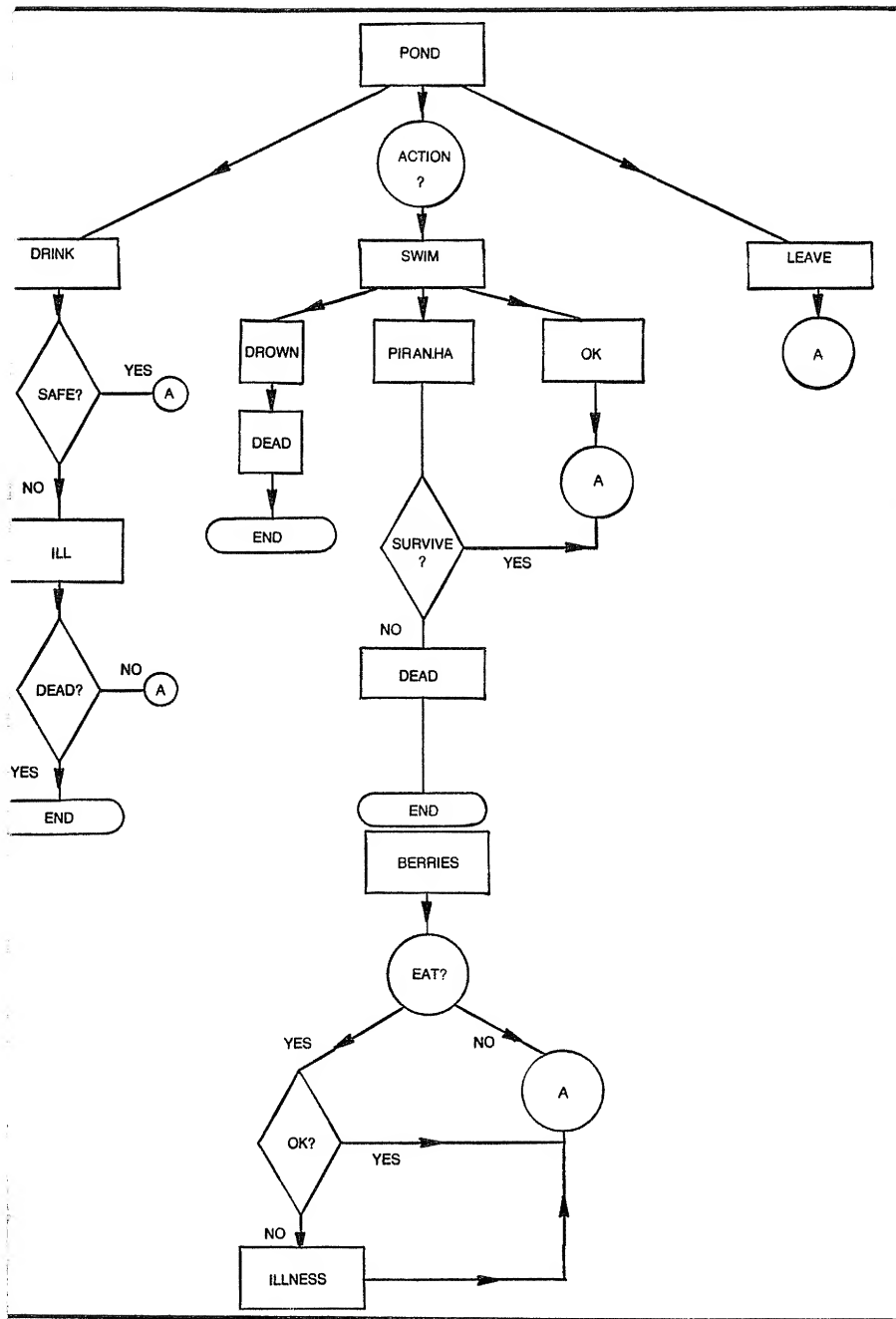
```
185    GOSUB 500
190    PRINT"YOU'RE DECEASED."
195    END
200    REM* TREE BRANCH ATTEMPT*
202    LET L=J*10
204    LET Q=INT(RND(0)*L)+1
206    IF Q>100 THEN GOTO 215
208    PRINT"YOU DIDN'T MAKE IT"
210    GOSUB 500
212    GOTO 190
215    PRINT"YOU MADE IT!"
217    LET K=K-INT(RND(0)*K*.67)
220    GOTO 70
225    REM* ANIMAL ATTACK*
227    IF Y=2 THEN PRINT"WOLF";
230    IF Y=3 THEN PRINT"LION";
232    PRINT"AHEAD. WHAT DO YOU DO?"
234    PRINT"A — FLEE"
236    PRINT"B — SHOOT IT"
238    PRINT"C — USE YOUR SLINGSHOT"
240    PRINT"D — USE YOUR KNIFE"
242    PRINT"E — CLIMB A TREE"
245    INPUT X
250    GOSUB 500
252    IF X=A THEN GOTO 285
255    IF X=B THEN GOTO 330
260    IF X=C THEN GOTO 350
265    IF X=D THEN GOTO 355
270    IF X=E THEN GOTO 390
272    REM*NO VALID CHOICE*
275    LET K=K-1
277    PRINT"IT'S STILL THERE. NOW WHAT?"
280    GOTO 234
285    GOSUB 1000
287    REM* FLEE*
290    IF Z=X THEN GOTO 760
292    LET Q=INT(RND(0)*J)+1
294    LET K=K-INT(RND(0)*K/2)
296    IF Q<9 THEN GOTO 315
298    PRINT"WHEW!"
300    GOSUB 500
305    PRINT"YOU MADE IT TO SAFETY!"
310    GOTO 70
315    PRINT"IT CATCHES YOU!"
317    LET K=K-INT(RND(0)*K)+1
318    IF K<10 THEN GOTO 185
```

```
320    LET J=J-1
322    PRINT"NOW WHAT DO YOU DO?":GOTO 234
325    IF M<1 THEN GOTO 615
327    GOSUB 500
330    PRINT:PRINT" "," BANG!!!":PRINT
332    LET L=J*2.5:LET M=M-1
334    GOSUB 500
336    LET Q=INT(RND(0)*L)+1
338    IF Q>17 THEN GOTO 440
340    PRINT"YOU MISSED!"
345    GOTO 315
350    LET L=J*1.5
352    GOTO 334
355    LET L=J*1.7
357    IF Y=3 THEN LET L=L*2
360    LET Q=INT(RND(0)*L)+1
365    IF Q>18 THEN GOTO 440
370    PRINT"IT OVERPOWERS YOU!"
372    LET K=K-(2*Q)
375    IF K<15 THEN GOTO 185
380    GOTO 320
390    IF Y=3 THEN GOTO 430
392    LET Q=INT(RND(0)*40)+1
395    GOSUB 500
397    LET K=K-Q
400    PRINT"THE WOLF DOES NOT LEAVE FOR ";Q;" HOURS"
405    IF K<7 THEN GOTO 420
410    PRINT"THEN YOU CAN CLIMB DOWN"
415    GOTO 70
420    PRINT"YOU DIE OF THIRST AND STARVATION"
425    END
430    PRINT"LIONS CAN CLIMB TREES BETTER THAN PEOPLE."
435    GOTO 185
440    PRINT"GOT 'EM!"
442    GOSUB 500
445    PRINT"DO YOU EAT IT?"
447    PRINT"A — YES"
450    PRINT"B — NO"
452    INPUT X
455    IF X=A THEN LET K=K+J
460    GOTO 70
470    PRINT"YOU DROP FROM EXHAUSTION"
475    GOTO 185
500    LET W=INT(RND(0)*888)+1
505    FOR V=1 TO W
507    NEXT V
```

```
510  RETURN
520  PRINT" A BLACK WIDOW SPIDER LANDS ON YOUR NECK!"
522  PRINT"WHAT DO YOU DO?"
525  PRINT"A — HOLD AS STILL AS POSSIBLE"
527  PRINT"B — TRY TO BRUSH IT OFF"
530  PRINT"C — SHOOT IT"
532  PRINT"D — CRY"
535  INPUT X
537  GOSUB 500
540  IF X=A THEN GOTO 580
542  IF X=B THEN GOTO 580
545  IF X=C THEN GOTO 570
550  GOTO 180
570  PRINT:PRINT" ","BANG!":PRINT
573  GOSUB 500
575  GOTO 180
580  LET L=J*4
582  LET Q=RND(0)*L)+1
584  IF Q<J*2 THEN GOTO 600
586  PRINT"IT BITES!"
588  GOSUB 500
590  GOTO 185
600  PRINT"IT CRAWLS OFF WITHOUT BITING"
605  GOTO 70
615  PRINT"YOU ARE OUT OF BULLETS"
620  GOTO 370
630  PRINT"YOU COME TO A FRESH WATER POND"
632  PRINT"WHAT DO YOU DO?"
634  PRINT"A — DRINK"
636  PRINT"B — SWIM"
638  PRINT"C — LEAVE"
640  INPUT X
642  GOSUB 500
645  IF X=A THEN GOTO 670
650  IF X=B THEN GOTO 690
655  IF X=C THEN GOTO 735
660  GOTO 640
670  LET Q=INT(RND(0)*Q)+1
672  IF Q<6 THEN GOTO 680
675  LET K=K+(RND(0)*K)−9
677  GOTO 70
680  PRINT"IT MAKES YOU QUITE ILL"
682  LET K=K−INT(RND(0)*K)
685  GOTO 70
690  LET Q=INT(RND(0)*4)+1
692  GOSUB 500
```

```
695   LET K=K-2
697   IF Q=1 THEN GOTO 710
700   IF Q=2 THEN GOTO 715
702   GOSUB 500
705   GOTO 70
710   PRINT"YOU DROWN!"
712   GOTO 185
715   PRINT"A PIRANHA STRIKES!"
717   GOSUB 500
720   LET Q=INT(RND(0)*J)+1
722   IF Q<20 THEN GOTO 185
725   PRINT"YOU MANAGE TO ESCAPE WITHOUT SERIOUS IN-
      JURY"
730   LET K=K-INT(RND(0)*K)
732   GOTO 70
735   GOSUB 1000
737   IF Z=X THEN GOTO 750
740   GOTO 70
750   PRINT:PRINT" ","SPLASH!":PRINT
755   GOTO 690
760   PRINT"YOU JUST COLLIDED WITH THE";
765   IF Y=2 THEN PRINT"WOLF!"
770   IF Y=3 THEN PRINT"LION!"
775   GOSUB 500
780   GOTO 185
1000  LET K=K-.5
1002  PRINT"WHICH WAY DO YOU GO?"
1004  PRINT"A — EAST"
1006  PRINT"B — WEST"
1008  PRINT"C — NORTH"
1010  PRINT"D — SOUTH"
1012  INPUT X
1015  IF X=A THEN GOTO 1050
1017  IF X=B THEN GOTO 1055
1020  IF X=C THEN GOTO 1060
1025  IF X=D THEN GOTO 1065
1030  GOTO 1000
1050  LET F=F-1:LET G=G+1
1052  GOTO 1070
1055  LET F=F+1:LET G=G-1
1057  GOTO 1070
1060  LET H=H-1:LET I=I+1
1062  GOTO 1070
1065  LET H=H+1:LET I=I-1
1070  IF F=0 THEN GOTO 1120
1075  IF G=0 THEN GOTO 1120
```

```
1080  IF H=0 THEN GOTO 1120
1085  IF I=0 THEN GOTO 1120
1090  IF K<5 THEN GOTO 470
1095  IF F<10 THEN GOTO 1130
1100  IF G<10 THEN GOTO 1130
1105  IF H<10 THEN GOTO 1130
1110  IF I<10 THEN GOTO 1130
1115  RETURN
1120  PRINT"YOU MADE IT SAFELY BACK TO CIVILIZATION!"
1125  END
1130  PRINT"YOU CAN SEE SUNLIGHT THROUGH THE
      TREETOPS!"
1135  RETURN
```

TRS-80 BASIC

```
5   A=11:B=12:C=13:D=14:E=25:P.:P.
10  P.“ ”,“LOST IN THE JUNGLE”:P.:GOS.500
15  P.“YOU ARE LOST IN A JUNGLE. YOU HAVE A GUN WITH 6”
20  P.“BULLETS, A KNIFE, & A SLINGSHOT THE TRICK IS TO”
25  P.“FIND YOUR WAY BACK TO CIVILIZATION WITHOUT
    GETTING”
30  P.“YOURSELF KILLED. EACH MOVE IS ONE MILE. THE
    JUNGLE”
35  P.“IS 100 MILES SQUARE. PRESS ‘ENTER’ TO START”
40  IN.A$:M=20:H=12
45  IN.“DO YOU WANT AN EASY, MEDIUM OR HARD GAME”;J
50  K=100:F=RND(50)+20:H=RND(50)+20:I=100−H:
    M=6:G=100−F
70  GOS.1000:Z=X:S=J−4
75  Y=RND(S):GOS.500:IF Y=1 G.150
80  IF Y<4 G.225
85  IF Y=4 G.520
90  IF Y=6 THEN GOTO 630
95  IF Y=7 G.105
100 G.70
105 P. “YOU COME TO A BUSH OF BERRIES”:Y=17:N=18
110 IN.“DO YOU EAT THEM”;Q:IF Q=17 G.120
115 B.70
120 K=K+(J/10):L=RND(J):IF L<(J*.75)G.140
130 P.“THEY MAKE YOU QUITE ILL”:K=K−RND(K)
135 G.70
140 K=K+(J/10):G.70
150 P.“YOU STEP INTO QUICKSAND!”:GOS.500
155 P.“WHAT DO YOU DO?”P.“A— TRY TO CLAW YOUR WAY
    OUT”
160 P.“B—GIVE UP”:P.“C— GRAB ONTO A TREE BRANCH”
165 P.“D— START PRAYING”:IN.X
```

```
170   IF X=C G.200
180   P. "SORRY      ";:GOS.500
190   P. "YOU'RE DECEASED."
195   END
200   L=J*10:Q=RND(L):IF Q>100G.215
205   P. "YOU DIDN'T MAKE IT."
210   GOS.500:G.190
215   P. "YOU MADE IT!":K=K−INT(RND(K)*.67)
220   G.70
225   IF Y=2 P. "WOLF";
230   IF Y=3 P. "LION";
232   P. "AHEAD!":P. "WHAT DO YOU DO?"
235   P. "A— FLEE":P. "B— SHOOT IT":P. "C— USE YOUR
      SLINGSHOT"
240   P. "D—USE YOUR KNIFE":P. "E— CLIMB A TREE"
245   IN.X
250   GOS.500:IF X=A G.285
255   IF X=B G.330
260   IF X=C G.350
265   IF X=D G.355
270   IF X=E G.390
275   K=K−1:P. "IT'S STILL THERE. NOW WHAT?"
280   G.235
285   GOS.1000:IF Z=X G.760
290   Q=RND(J(:K=K−INT(RND(K)/2)
295   IF Q<9 G.315
300   P. "WHEW!":GOS.500:P. "YOU MADE IT TO SAFETY!"
305   B.70
315   P. "IT CATCHES YOU!":K=K−RND(K)
317   IF K<10 G.185
320   J=J−1:P. "NOW WHAT DO YOU DO?":G.235
325   IF M< G.615
330   GOS.500:P.:P. " ","BANG!!!":P.:L=J*2.5:M=M−1
335   GOS.500:Q=RND(L):IF Q<17 G.440
340   P. "YOU MISSED!"
345   G.315
350   L=J*1.5:G.335
355   L=J*1.7:IF Y=3 THEN L=L*2
360   Q=RND(L):IF Q>18 G.440
370   P. "IT OVERPOWERS YOU!!":K=K−(2*Q):IF K<15 G.185
380   G.320
390   IF Y=3 G.430
395   Q=RND(4)):GOS.500:K=K−Q
400   P. "THE WOLF DOES NOT LEAVE FOR";Q:" HOURS."
405   IF K<7 G.420
410   P. "THEN YOU CAN CLIMB DOWN":G.70
```

```
420   P."YOU DIE OF THIRST AND STARVATION."
425   END
430   P."LIONS CAN CLIMB TREES BETTER THAN PEOPLE."
435   G.185
440   P."GOT'EM!":GOS.500:P."DO YOU EAT IT?"
450   P."A — YES":P."B— NO":IN.X
455   IF X=A THEN K=K+J
460   G.70
470   P."YOU DROP FROM EXHAUSTION":G.185
500   W=RND(888)
505   F.V=1TOW:N.V
510   RET.
520   P."A BLACK WIDOW SPIDER LANDS ON YOUR NECK!
525   P."WHAT DO YOU DO?":P."A— HOLD AS STILL AS
      POSSIBLE"
530   P."B— TRY TO BRUSH IT OFF":P."C— SHOOT IT"
535   P."D— CRY":IN.X:GOS.500:IF X=A G.580
540   IF X=B G.580
545   IF X=C G.570
550   G.180
570   P.:P." ","BANG!":P.:GOS.500:G.180
580   L=J*4:Q=RND(L):IF Q<J G.600
585   P."IT BITES!":GOS.500
590   G.180
600   P."IT CRAWLS OFF WITHOUT BITING":G.70
615   P."YOU ARE OUT OF BULLETS!":G.370
630   P."YOU COME TO A FRESH WATER POND":P."WHAT DO
      YOU DO?"
635   P."A— DRINK":P."B— SWIM":P."C— LEAVE"
640   IN.X
645   GOS.500:IF X=A G.670
650   IF X=B G.690
660   IF X=C G.735
665   G.640
670   Q=RND(J):IF Q<6 G.680
675   K=K+(RND(K)—10):G.70
680   P."IT MAKES YOU QUITE ILL"
685   K=K—RND(K):G.70
690   Q=RND(4):GOS.500:K=K—2:IF Q=1 G.710
700   IF Q=2 G.715
705   GOS.500:G.70
710   P."YOU DROWN!":GOS.500:G.190
715   P."A PIRANHA STRIKES!!":GOS.500:Q=RND(J)
720   IF Q<20 G.185
725   P."YOU MANAGE TO ESCAPE WITHOUT SERIOUS INJURY"
730   K=K—RND(K):G.70
```

```
735    GOS.1000:IF Z=X G.750
740    G.70
750    P.:P."  ","SPLASH!":P.G.690
760    P."YOU JUST COLLIDED WITH THE ";
765    IF Y=2 P."WOLF!"
770    IF Y=3 P."LION!"
775    GOS.500:G.185
1000   K=K-.5:P."WHICH WAY WILL YOU GO?"
1005   P."A— EAST":P."B— WEST":P."C— NORTH"
1010   P."D— SOUTH":IN.X:IF X=A G.1050
1015   IF X=B G.1055
1020   IF X=C G.1060
1025   IF X=D G.1065
1030   G.1000
1050   F=F-1:G=G+1:G.1070
1055   F=F+1:G=G-1:G.1070
1060   H=H-1:I=I+1:G.1070
1065   H=H+1:I=I-1
1070   IF F=0 G.1120
1075   IF G=0 G.1120
1080   IF H=0 G.1120
1085   IF I=0 G.1120
1090   IF K<5 G.470
1095   IF F<10 G.1130
1100   IF G<10 G.1130
1105   IF H<10 G.1130
1110   IF I<10 G.1130
1115   RET.
1120   P."YOU MADE IT SAFELY BACK TO CIVILIZATION!"
1125   END
1130   P."YOU CAN SEE SUNLIGHT THROUGH THE TREETOPS!"
1140   RET.
```

Summary Of Variables Used

A   OPTION SELECTOR
B   OPTION SELECTOR
C   OPTION SELECTOR
D   OPTION SELECTOR
E   OPTION SELECTOR/EASY GAME
F   DISTANCE EAST
G   DISTANCE WEST
H   DISTANCE NORTH/HARD GAME
I   DISTANCE SOUTH
J   GAME DIFFICULTY
K   STRENGTH

L   CHANCE SELECTOR
M   MEDIUM GAME/# OF BULLETS LEFT.
Q   CHANCE SELECTOR
S   CHANCE SELECTOR
W   TIMING
X   SELECTED OPTION
Y   CHANCE SELECTOR

Sample Run (Excerpt)

DO YOU WANT AN EASY, MEDIUM OR HARD GAME? EASY
WHICH WAY WILL YOU GO?
A — EAST
B — WEST
C — NORTH
D — SOUTH
? C
A BLACK WIDOW SPIDER LANDS ON YOUR NECK!
WHAT DO YOU DO?
A — HOLD AS STILL AS POSSIBLE
B — TRY TO BRUSH IT OFF
C — SHOOT IT
D — CRY
?A
IT CRAWLS OFF WITHOUT BITING
WHICH WAY WILL YOU GO?
A — EAST
B — WEST
C — NORTH
D — SOUTH
?A
LION AHEAD!
WHAT DO YOU DO?
A — FLEE
B — SHOOT IT
C — USE YOUR SLINGSHOT
D — USE YOUR KNIFE
E — CLIMB A TREE
? B
                        BANG!
YOU MISSED
IT CATCHES YOU
NOW WHAT DO YOU DO?
A — FLEE
B — SHOOT IT
C — USE YOUR SLINGSHOT

D — USE YOUR KNIFE
E — CLIMB A TREE
?A
WHICH WAY WILL YOU GO?
A — EAST
B — WEST
C — NORTH
D — SOUTH
?D
WHEW!
YOU MADE IT TO SAFETY!
WHICH WAY WILL YOU GO?
A — EAST
B — WEST
C — NORTH
D — SOUTH
? A

Galactic Search

Galactic Search is another adventure game. While random chance plays a part, there's more opportunity for planning strategy in this game. The instructions are given within the program. See Fig. 1-7 for the flowchart.

Standard BASIC

```
  5  FOR X=1TO200:PRINT
 10  LET Y=INT(RND(0)*26)+1
 12  LET A(X)=Y:NEXT X
 15  PRINT"YOU ARE ";
 17  LET A=INT(RND(0)*5)+1
 18  FOR X=501TO600:LETY=INT(RND(0)*1000)+1
 20  IF A=1 THEN LET A$="AKRANAID"
 22  LET A(X)=Y: NEXT X
 25  IF A=2 THEN LET A$="OLK"
 30  IF A=3 THEN LET A$="ZOLAR ZINNK"
 35  IF A=4 THEN LET A$="GUAMBNA"
 40  IF A=5 THEN LET A$="JOHN DOE"
 45  PRINT A$;"—CAPTAIN OF THE SPACESHIP
 50  PRINT"'EVENING STAR' FROM THE PLANET RAMSNEID"
 55  LET J=0:PRINT"RAMSNEID CIRCLES THE STAR KNOWN AS
     FR-972"
 60  PRINT"AND IS IN DIRE NEED OF THE RARE
     SUBSTANCE,BRETCHENKOEL"
 65  PRINT"THERE IS NO BRETCHENKOEL LEFT IN THE SOLAR
     SYSTEM"
 70  PRINT"AND WITHOUT THIS SUBSTANCE TO FUEL THE
     PLANET'S"
 75  PRINT"POWER STATIONS, YOUR PEOPLE WILL DIE OUT."
 80  PRINT"THIS IS WHY THE RAMSNEIDIANS HAVE TAKEN UP
     SPACE"
 85  PRINT"TRAVEL, DESPITE ITS STRANGE & UNPREDICTABLE
     DANGERS"
 87  FOR X=201 TO 300
 90  LET Y=INT(RND(0)*999)+1
 92  LET A(X)=Y:NEXT X
 94  PRINT"YOUR MISSION, CAPTAIN "A$:", IS TO SEARCH
     THE"
 96  PRINT"GALAXY FOR MORE BRETCHENKOEL. YOU WILL
     BE"
100  PRINT"FLYING BY GUESS WORK MOST OF THE TIME"
102  FOR X=301 TO 400
```

Fig. 1-7. Galactic Search flowchart.
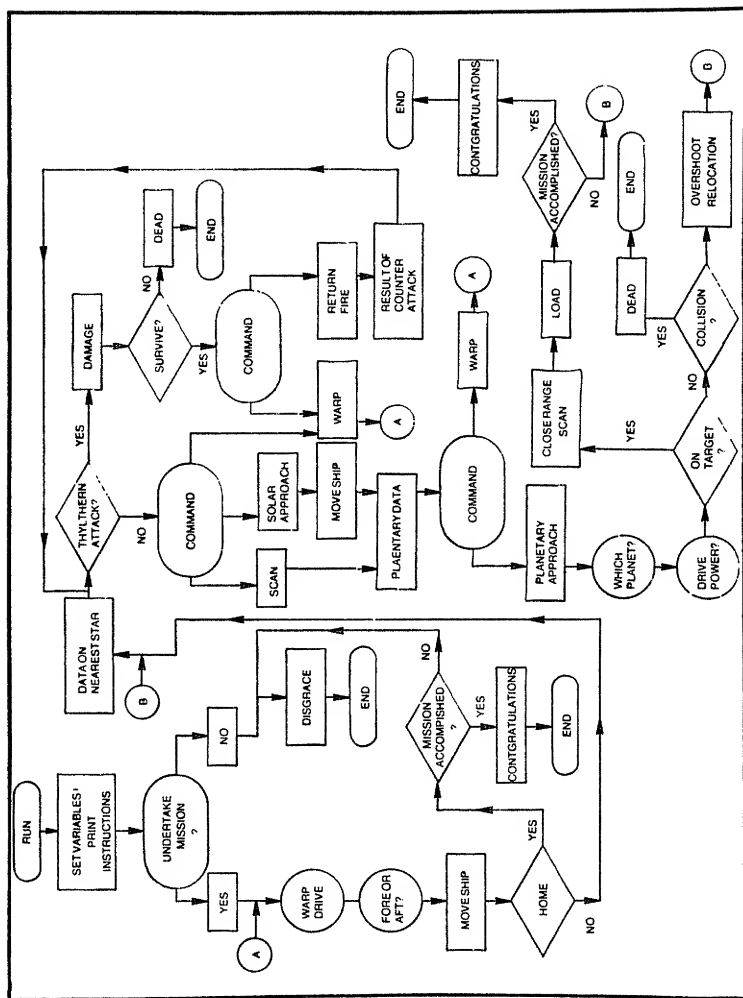
```
104   LET Y=INT(RND(0)*17)+1
106   IF Y=17 THEN Y=0
108   IF Y=1 THEN Y=0
110   LET A(X)=Y:NEXT X
115   GOSUB 1230
117   PRINT"BUT WATCH OUT FOR METEORS, AND THE
      GREATLY FEARED"
120   PRINT"WAR-LOVING THYLTHRENS!"
122   FOR X=401TO500
124   LET Y=INT(RND(0)*10)+1
126   LET A(X)=Y:NEXT X
128   LET N=15
130   PRINT"ARE YOU PREPARED TO UNDERTAKE THIS
      MISSION";
132   INPUT X
135   IF X=Y GOTO 180
140   IF X=N GOTO 160
145   PRINT!YOU MUST ANSWER YES OR NO,";A$
150   GOTO 130
160   PRINT"YOU ARE A GREAT SHAME TO YOUR RACE,";A$;"!"
162   PRINT:GOSUB 2000
164   PRINT" ","GOOD-BYE!"
166   END
180   PRINT:PRINT
182   LET Z=1:LET T=1
185   LFT G=30000:LET J=0
195   REM* THE PLAY *
200   PRINT"WARP DRIVE";
202   INPUT X
204   LET T=T+1
206   IF X> 50 THEN GOTO 1000
208   LET F=100:LET A=200
210   PRINT"FORE OR AFT";
212   INPUT Y
215   IF Y=F THEN GOTO 240
220   IF Y=A THEN GOTO 240
225   LET T=T+3
230   GOSUB 2100
235   GOTO 200
240   LET B=X*10:LET C=B/2
242   GOSUB 1130
244   GOSUB 2100
246   FOR L=1 TO C:PRINT" * ";
248   FOR M=1TO234:NEXT M
250   NEXT L
252   LET G=G-B
```

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```
254   IF G< 1 THEN GOTO 1150
256   IF Y=A THEN GOTO 1200
260   LET Z=Z+X
265   IF Z>100 THEN GOTO 1220
270   IF Z<1 THEN GOTO 1220
275   IF Z=1 THEN GOTO 1300
280   LET S=Z-1
285   PRINT"YOU ARE ";S;" SECTORS FROM HOME"
290   GOSUB 1500
295   LET A=Z+100:LET B=Z+200
300   LET C=Z+300:LET D=Z+400
302   LET E=Z+500
305   PRINT"THE NEAREST STAR IS ";
307   LET K=A(Z)
310   GOSUB 1240
312   LET K=A(A)
314   GOSUB 1240
316   PRINT" *";
318   LET K=A(B):PRINT K
320   PRINT"DISTANCE IS ";
322   LET K=A(E)
324   PRINT K;" LIGHT YEARS"
326   IF A(Z)=6 THEN GOTO 1320
330   LET P=A(C)
332   PRINT"THERE ARE ";P"PLANETS"
335   LET H=A(D)
340   PRINT H;" THYLTHRENS IN SOLAR SYSTEM"
345   LET N=601
350   FOR M=1 TO P
355   LET A(N)=INT(RND(0)*40)+1
357   LET N=N+1:NEXT M
360   IF H>0 THEN GOTO 830
365   PRINT"1 FOR SCAN—2 FOR SOLAR APPROACH—3 FOR
      WARP";
367   INPUT S
370   IF S=3 THEN GOTO 200
375   IF S=2 THEN GOTO 800
380   IF S=1 THEN GOTO 430
385   PRINT"BAD INPUT!!!"
387   GOSUB 2000
390   PRINT"COMPUTER JAMMED!"
392   GOSUB 2000
394   PRINT:LET S=ABS(S)
396   LET T=T+S+1
398   GOSUB 2000
400   GOSUB 2100
```

```
402   LET S=INT(RND(0)*5)+1
405   IF S=4 THEN GOTO 365
410   IF S=5 THEN GOTO 365
415   GOTO 370
430   REM* SCAN MODE*
432   IF K>5000THEN GOTO 635
435   PRINT" ","SCANNING -------":PRINT
437   LET N=601:FOR Q=1 TO P
440   LET O=A(N)
442   GOSUB 2000
444   PRINT"PLANET #";Q,
446   GOSUB 2000
448   LET N=N+1
450   PRINT O
455   NEXT Q
457   GOSUB 2000
460   LET T=T+.67
462   GOSUB 2100
465   PRINT"3 FOR WARP,4 FOR PLANETARY APPROACH";
467   INPUT S
470   IF S=4 THEN GOTO 500
475   IF S=3 THEN GOTO 200
480   GOTO 385
500   PRINT:PRINT" ","PLANETARY APPROACH":PRINT
502   LET T=T+1.3
504   GOSUB 2100
506   PRINT"TARGET—PLANET#"
508   INPUT S
510   IF S> P THEN GOTO 1370
515   IF S<1 THEN GOTO 385
520   LET W=(K/P)*S
525   LET X=INT(RND(0)*100)+1
527   LET Y=INT(RND(0)*4)+1
530   IF Y> 2 THEN LET X=0-X
535   LET W=W+X
540   PRINT"DISTANCE TO PLANET #";S;"---";W
542   IF W<100 THEN GOTO 650
545   PRINT"APPROACH DRIVE POWER";
547   INPUT V
550   LET T=T+V:LET G=G-V
552   GOSUB 1500
555   IF V> 12 THEN GOTO 1020
557   IF V<2.2 THEN GOTO 385
560   LET U=INT(RND(0)*13)+1
562   LET V=V*U*3
565   GOSUB 2100
```

```
567   LET W=W-V
570   IF W<7 THEN GOTO 580
575   GOTO 540
580   IF W<-10 THEN GOTO 600
582   IF W<-6 THEN GOTO 650
585   PRINT"YOU COLLIDED WITH THE PLANET!"
587   GOSUB 2000
590   PRINT" YOU CLUMSY CLOD!"
592   GOSUB 2000
595   GOTO 1050
600   PRINT"OVER-SHOOT!"
602   GOSUB 2000
605   PRINT"EXCESS VELOCITY PROPELS YOU AWAY FROM
      TARGET"
607   LET T=T+10
610   LET K=K+INT(RND(0)*8000)+(2*V)-(W+INT(RND(0)*1000)
615   PRINT"SOLAR DISTANCE IS ";K;" LIGHT YEARS"
620   GOSUB 2000
625   GOTO 365
635   PRINT"DISTANCE TOO GREAT FOR SCAN OR PLANETARY
      APPROACH"
640   LET T=T+6.73
645   GOTO 365
650   PRINT"TARGET ACHIEVED!"
655   GOSUB 2000
660   PRINT"CLOSE RANGE SCAN---";
662   GOSUB 2000
664   LET T=T-2.3
666   LET F=S+600
670   LET P=A(F)
675   LET P=(P/4)*(INT(RND(0)*25)+2)
680   IF P>100 THEN P=0
685   PRINT"ATMOSPHERIC% OF BRETCHENKOEL--PLANET
      #";S
690   GOSUB 2000
695   PRINT" "," ",P;"%":PRINT
700   IF P=0 THEN GOTO 790
705   IF P<25 THEN GOTO 780
710   IF P>87 THEN GOTO 750
712   PRINT"LOADING---"
714   GOSUB 2000
716   GOSUB 2000
718   LET B=INT(RND(0)*17)+4
720   LET P=P*B
722   PRINT:PRINT
724   PRINT P;"UNITS OF BRETCHENKOEL COLLECTED"
```

```
726  LET G=G+P-20
728  LET J=J+P
730  GOSUB 2000
732  PRINT"TOTAL BRETCHENKOEL NOW ON BOARD--";
734  GOSUB 2000
736  PRINT J:PRINT:PRINT
738  LET T=T-4
740  IF J<5020 THEN GOTO 365
750  PRINT"MISSION ACCOMPLISHED!"
752  GOSUB 2000
755  PRINT"GOOD WORK, ";A$
757  GOSUB 2000
760  PRINT"YOUR PEOPLE ARE SAVED!"
765  END
780  LET T=T+2
782  PRINT"THAT'S SCARCELY WORTH BOTHERING WITH!"
784  GOSUB 2000
786  GOSUB 2100
788  LET J=J+P:GOTO 730
790  PRINT"THERE'S NO BRETCHENKOEL HERE, STUPID!"
792  LET T=T+13
794  GOSUB 2100
796  GOTO 365
800  LET K=K-INT(RND(0)*K)
802  LET T=T+1.5
805  IF K<200 THEN GOTO 1600
810  GOTO 320
830  PRINT"THYLTHERNS ATTACK!!"
832  LET Q=0:GOSUB 2000
835  LET N=INT(RND(0)*10)+601
837  FOR L=1 TO H
840  LET U=A(N)
842  PRINT U;"MEGABLORTS OF ENERGY FROM THYLTHERN
     #2":L
845  LET N=N+1:LET Q=Q+U-INT(RND(0)*10)
847  NEXT L:LET T=T+H
850  GOSUB 2100
852  IF Q>400 THEN GOTO 1400
855  PRINT"3 FOR WARP, 5 TO RETURN FIRE ";
857  INPUT S
860  IF S=3 THEN GOTO 200
865  IF S=5 THEN GOTO 880
870  PRINT"BAD INPUT"
872  GOTO 830
880  PRINT"MEGABLORTS";
882  INPUT M
```

```
884   LET T=T+M
886   LET F=INT(RND(0)*201)+1
888   IF M> 1000 THEN GOTO 1040
890   IF M<F THEN GOTO 910
895   LET M=M-35-INT(RND(0)*100)
897   LET H=H-1:LET T=T+1.2
900   PRINT"1THYLTHERN DESTROYED!"
902   IF H=0 THEN GOTO 930
910   PRINT H;"THYLTHRENS LEFT"
915   LET Q=0
920   GOTO 835
930   PRINT"GOT 'EM ALL!"
932   GOSUB 2000
934   LET T=T+INT(RND(0)*10)+1
936   GOSUB 2100
940   GOTO 365
1000  FOR L=1 TO 500:NEXT L
1005  LET Y=INT(RND(0)*30)+1
1010  FOR M=1 TO Y
1015  PRINT" *";
1020  NEXT M
1025  PRINT"OVER-DRIVE!!!"
1030  FOR M=1TO Y
1035  PRINT" * ";
1040  NEXT M
1045  PRINT:FOR L=1 TO 470:NEXT L
1050  PRINT"YOU BLEW IT, ";A$
1055  GOSUB 2000
1060  PRINT"YOU ARE DEAD ";
1065  GOSUB 2000
1070  PRINT"AND SO ARE ALL THE PEOPLE BACK ON
      RAMSNEID!"
1075  FOR L=1 TO 908:NEXT L
1080  GOTO 160
1100  PRINT"IT'S TOO LATE!"
1102  GOSUB 2000
1105  PRINT"EVERYONE BACK HOME IS DEAD!"
1110  GOSUB 2000
1115  GOTO 160
1130  IF C<80 THEN GOTO 1140
1135  LET C=C/2
1137  GOTO 1130
1140  RETURN
1150  PRINT" ","OOPS!"
1152  GOSUB 2000
```

```
1155   PRINT"YOU ARE OUT OF FUEL!"
1160   GOSUB 2000
1165   PRINT"WHAT SHODDY PLANNING!"
1170   GOTO 1055
1200   LET Z=Z−X
1205   IF Z<1 THEN GOTO 1220
1210   GOTO 285
1220   PRINT"YOU JUST WARPED 'EVENING STAR' RIGHT OUT"
1222   PRINT"OF THE GALAXY!"
1225   GOTO 1160
1230   LET A(1)=6
1232   LET A(101)=18
1234   LET A(201)=972
1235   GOTO 1270
1240   IF K=1 THEN PRINT"A";
1241   IF K=2 THEN PRINT"B";
1242   IF K=3 THEN PRINT"C";
1243   IF K=4 THEN PRINT"D";
1244   IF K=5 THEN PRINT"E";
1245   IF K=6 THEN PRINT"F";
1246   IF K=7 THEN PRINT"G";
1247   IF K=8 THEN PRINT"H";
1248   IF K=9 THEN PRINT"I";
1249   IF K=10 THEN PRINT"J";
1250   IF K=11 THEN PRINT"K";
1251   IF K=12 THEN PRINT"L";
1252   IF K=13 THEN PRINT"M";
1253   IF K=14 THEN PRINT"N";
1254   IF K=15 THEN PRINT"O";
1255   IF K=16 THEN PRINT"P";
1256   IF K=17 THEN PRINT"Q";
1257   IF K=18 THEN PRINT"R";
1258   IF K=19 THEN PRINT"S";
1259   IF K=20 THEN PRINT"T";
1260   IF K=21 THEN PRINT"U";
1261   IF K=22 THEN PRINT"V";
1262   IF K=23 THEN PRINT"W";
1263   IF K=24 THEN PRINT"X";
1264   IF K=25 THEN PRINT"Y";
1265   IF K=26 THEN PRINT"Z";
1267   RETURN
1270   FOR X=401 TO 500
1272   LET Y=INT(RND(0)*30)+1
1275   IF Y> 13 THEN LET Y=0
1277   LET A(X)=Y
1280   NEXT X
1285   FOR X=501 TO 600
```

```
1290   LET Y=INT(RND(0)*8010)+1
1292   LET A(X)=Y:NEXT X
1295   RETURN
1300   PRINT"YOU CAME HOME WITHOUT ENOUGH
       BRETCHENKOEL?!?"
1305   GOSUB 2000
1310   PRINT"YOU ARE PROMPTLY LYNCHED!"
1315   GOTO 160
1320   IF A(A)=18 THEN GOTO 1330
1325   GOTO 340
1330   IF A(B)=972 THEN GOTO 1340
1335   GOTO 340
1340   PRINT"HEY"
1342   GOSUB 2000
1344   PRINT"YOU MUST'VE GONE THROUGH A BLACK HOLE OR"
1346   PRINT" SOMETHING, BECAUSE SUDDENLY YOU'RE
       HOME!"
1348   GOSUB 2000
1350   PRINT"AND WHAT A GREETING YOU RECEIVE!"
1352   GOSUB 2000
1355   PRINT"THE PEOPLE ALL GATHER AROUND AND SAY—"
1357   GOSUB 2000
1360   GOTO 1300
1370   PRINT"NO SUCH PLANET"
1372   PRINT:PRINT
1375   LET F=INT(RND(0)*30)+1
1377   LET T=T+F
1380   IF F> 23 THEN GOTO 1390
1385   GOTO 390
1390   PRINT" YOU ARE HEREBY STRIPPED OF YOUR
       COMMAND!"
1392   GOSUB 2000
1395   GOTO 160
1400   PRINT"EVENING STAR IS DESTROYED!"
1405   GOSUB 2000
1410   GOTO 1045
1500   LET M=INT(RND(0)*101)+1
1505   IF M>97 THEN GOTO 1520
1510   RETURN
1520   PRINT"METEOR STRIKE!!!!"
1522   LET M=INT(RND(0)*34)+1
1525   LET T=T+M
1530   IF T>100 THEN GOTO 1100
1535   RETURN
2000   LET Y=INT(RND(0)*1000)+100
2005   FOR X=1 TO Y
```

```
2010   NEXT X
2015   RETURN
2100   LET U=RND(0)
2105   LET T=T+U
2110   IF T>100 THEN GOTO 1100
2115   RETURN

1600   PRINT"YOU'VE DIVED INTO THE SUN!"
1605   GOSUB 2000
1610   GOTO 1400
```

TRS-80 BASIC

```
 10   CLS:P.;P." YOU ARE ";:A=RND(5)
 20   IF A=1 A$="AKRANAID"
 25   IF A=2 A$="OLK"
 30   IF A=3 A$="ZOLAR ZINNK"
 35   IF A=4 A$="GUAMBNA"
 40   IF A=5 A$="JOHN DOE"
 45   P.A$;" — CAPTAIN OF THE SPACESHIP"
 50   P."'EVENING STAR' FROM THE PLANET RAMSNEID"
 55   J=0:F.X=1TO200:Y=RND(26):A(X)=Y:N.X
 60   P."RAMSNEID CIRCLES THE STAR KNOWN AS FR-972 AND"
 65   P."IS IN DIRE NEED OF THE RARE SUBSTANCE,
       BRETCHENKOEL"
 70   P."THERE IS NO BRETCHENKOEL LEFT IN YOUR SOLAR
       SYSTEM"
 72   P."AND WITHOUT THIS SUBSTANCE TO FUEL THE
       PLANET'S"
 75   P."POWER STATIONS, YOUR PEOPLE WILL DIE OUT."
 77   P."THIS IS WHY THE RAMSNEIDIANS HAVE TAKEN UP
       SPACE"
 80   P."TRAVEL, DESPITE ITS STRANGE & UNPREDICTABLE
       DANGERS"
 85   F.X=201TO300:Y=RND(999):A(X)=Y:N.X
 90   PRINT"YOUR MISSION, CAPTAIN";A$;", IS TO SEARCH
       THE"
 95   PRINT"GALAXY FOR MORE BRETCHENKOEL. YOU WILL
       BE FLYING"
100   PRINT"BY GUESS WORK MOST OF THE TIME"
105   F.X=301TO400:Y=RND(17)
110   IF Y=17 THEN Y=0
112   IF Y=1 THEN Y=0
115   A(X)=Y:N.X:GOS.1230
117   PRINT"BUT WATCH OUT FOR METEORS, AND THE
       GREATLY FEARED,"
120   P."WAR-LOVING THYLTHRENS!"
125   F.X=401TO500:Y=RND(10):A(X)=Y:N.X:N=15
```

```
127   F.X=501TO600:Y=RND(1050):A(X)=Y:N.X
130   IN."ARE YOU PREPARED TO UNDERTAKE THIS
      MISSION":X
135   IF X=Y G.180
140   IF X=N G.160
145   P."YOU MUST ANSWER YES OR NO,";A$:G.130
160   P."YOU ARE A GREAT SHAME TO YOUR RACE,";A$;"!"
165   P.:GOS.2000:P." ","GOOD-BYE!"
170   END
180   P.:P.:Z=1:T=1
185   G=30000:J=0
200   IN."WARP DRIVE";X:T=T+1
205   IF X> 50 G.1000
210   F=100:A=200:IN."FORE OR AFT";Y
215   IF Y=F G.240
220   IF Y=A G.240
225   T=T+3:GOS.2100:G.200
240   B=X*10:C=B/2:GOS.1130:GOS.2100
245   F.L=1TOC:P."*";:F.M=1TO134:N.M:N.L
250   G=G-B:IF G> G.1150
260   IF Y=A G.1200
270   Z=Z+X
280   IF Z>100 G.1220
285   IF Z> 1 G.1220
290   IF Z=1 G.1300
295   S=Z-1:P."YOU ARE";S;"SECTORS FROM HOME"
300   GOS.1500:A=Z+100:B=Z+200:C=Z+300:D=Z+400:E+500
305   P."THE NEAREST STAR IS"::K=A(Z):GOS.1240
310   K=A(A):GOS.1240:P."*";:K=A(B):P.K
315   P."DISTANCE IS ";
320   K=A(E):P.K;" LIGHT YEARS"
325   IF A(Z)=6 G.1320
330   P=A(C):H=A(D):P."THERE ARE ";P;" PLANETS"
335   P."THERE ARE ";H;" THYLTHRENS IN SOLAR SYSTEM"
340   N=601:F.M=1TOP:A(N)=RND(40):N=N+1:N.M
350   IF H>0 G.830
365   IN."1 FOR SCAN — 2 FOR SOLAR APPROACH— 3 FOR
      WARP";S
370   IF S=3 G.200
375   IF S=2 G.800
380   IF S=1 G.430
385   P." BAD INPUT!!!":GOS.2000
390   P."COMPUTER JAMMED!":GOS.2000:P.
395   S=ABS(S):T=T+S+1:GOS.2000:GOS.2100
400   S=RND(5):IF S=4 G.365
405   IF S=5 G.365
```

```
410  G.370
430  IF K>5000 G.635
435  P." ","SCANNING -----":P:N=601
440  F.Q=1TOP:O=A(N):GOS.2000:P."PLANET #";Q,
445  GOS.2000:N=N+1:P.O:N.Q
460  GOS.2000:T=T+.67:GOS.2100
465  IN."3 FOR WARP,4 FOR PLANETARY APPROACH";S
470  IF S=4 G.500
475  IF S=3 G.200
480  G.385
500  P.:P." ","PLANETARY APPROACH":P.
502  T=T+1.3:GOS.2100
505  IN."TARGET --- PLANET #";S
510  IF S>P G.1370
515  IF S<1 G.385
520  W=(K/P)*S
525  X=RND(100):Y=RND(4)
530  IF Y> 2 THEN X=0-X
535  W=W+X
540  P."DISTANCE TO PLANET #";S;--- ";W
542  IF W<100 G.650
545  IN."APPROACH DRIVE POWER ";V
547  T=T+V:G=G-V:GOS.1500
550  IF V>12 G.1020
555  IF V< 2.2 G.385
560  U=RND(13):V=U*V*3:GOS.2100
565  W=w-V
570  IF W< 7 G.580
575  G.540
580  IF W<-10 G.600
582  IF W<-6 G.650
585  P."YOU COLLIDED WITH THE PLANET!":GOS.2000
590  P." YOU CLUMSY CLOD!"
595  GOS.2000:G.1050
600  PRINT"OVER-SHOOT!":GOS.2000
605  PRINT"EXCESS VELOCITY PROPELS YOU AWAY FROM
     TARGET"
610  T=T+10:K=K+RND(8000)+2*V-(W+RND(1000)
615  PRINT "SOLAR DISTANCE IS ";K;"LIGHT YEARS"
620  GOS.2000:G.365
635  PRINT"DISTANCE TOO GREAT FOR SCAN OR PLANETARY
     APPROACH"
640  T=T+6.73:G.365
650  PRINT"TARGET ACHIEVED!":GOS.2000
660  PRINT"CLOSE RANGE SCAN --- ";
665  GOS.2000:T=T+2.3:F=S+600
```

```
670   P=A(F)
675   P=(P/4)*(RND(25)+2)
680   IF P> 100 THEN P=0
685   PRINT"ATMOSPHERIC% OF BRETCHENKOEL — PLANET
      #";S
690   GOS.2000
695   P." "," ",P;"%":P.
700   IF P=0 G.790
705   IF P<25 G.780
710   IF P> 87 G.750
715   P."LOADING ---":GOS.2000:GOS.2000
720   B=RND(17)+3:P=P*B
722   P.P;" UNITS OF BRETCHENKOEL COLLECTED"
725   G=G+P-20:J=J+P
730   GOS.2000:P."TOTAL BRETCHENKOEL NOW ON BOARD --";
732   GOS.2000:P.J:P.:P.:T=T-4
735   IF J<5020G.365
750   P."MISSION ACCOMPLISHED!":GOS.2000
755   P."GOOD WORK, ";A$:GOS.2000
760   P."YOUR PEOPLE ARE SAVED!"
765   END
780   T=T+2:P."THAT'S SCARECELY WORTH BOTHERING
      WITH!"
785   GOS.2000:GOS.2100:J=J+P:G.730
790   P."THERE'S NO BRETCHENKOEL HERE, STUPID!"
792   T=T+13:GOS.2100
795   G.365
800   K=K-RND(K):T=T+1.5
805   IF K<200 G.1600
810   G.315
830   P."THYLTHERNS ATTACK!!"Q=0:GOS.2000
835   N=RND(10)+600:F.L=1TOH
840   U=A(N)
842   PRINT U;" MEGABLORTS OF ENERGY FROM THYLTHERN
      #";L
845   N=N+1:Q=Q+U-RND(10):N.L:T=T+H:GOS.2100
850   IF Q>400 G.1400
855   IN."3 FOR WARP, 5 TO RETURN TO FIRE";S
860   IF S=3 G.200
865   IF S=5 G.880
870   P." BAD INPUT!":G.830
880   IN."MEGABLORTS";M:T=T+M:F=RND(201)
885   IF M>1000G. 1040
890   IF M<F G.910
895   M=M-35-RND(100):H=H-:T=T+1.2
900   P."1 THYLTHERN DESTROYED!"
```

```
902    IF H=0 G.930
910    P.H;" THYLTHRENS LEFT":Q=0
915    G.835
930    P."GOT 'EM ALL!":GOS.2000
935    T=T+RND(10):GOS. 2100
940    G.365
1000   F.L=1TO500:N.L:Y=RND(30)
1005   F.M=1TOY:P." * ";:N.M
1010   P."OVER-DRIVE!!!"
1015   F.M=1TOY:P."*";:N.M
1045   P.:F.L=1TO470:N.L
1050   P."YOU BLEW IT, ";A$:GOS.2000
1060   P."YOU ARE DEAD ";:GOS.2000
1070   P."AND SO ARE ALL THE PEOPLE BACK ON REMSNEID!"
1080   F.L=1TO908:N.L:G.160
1100   P."IT'S TOO LATE!":GOS.2000
1105   P."EVERYONE BACK HOME IS DEAD!":GOS.2000
1110   G.160
1130   IF C<20 THEN G.1140
1135   C=C/2:G.1130
1140   RET.
1150   P." ","OOPS!":GOS.2000
1160   P."YOU ARE OUT OF FUEL!":GOS.2000
1165   P."WHAT SHODDY PLANNING!":G.1060
1200   Z=Z−X:IF Z<1G1220
1210   G.285
1220   P."YOU JUST WARPED 'EVENING STAR' RIGHT OUT OF"
1225   P."THE GALAXY!":G.1165
1230   A(1)=6:A(101)=18:A(201)=972
1235   G.1270
1240   IF K=1P."A";
1241   IF K=2P."B";
1242   IF K=3P."C";
1243   IF K=4P."D";
1244   IF K=5P."E";
1245   IF K=6P."F";
1246   IF K=7P."G";
1247   IF K=8P."H";
1248   IF K=9P."I";
1249   IF K=10P."J";
1250   IF K=11P."K";
1251   IF K=12P."L";
1252   IF K=13P."M";
1253   IF K=14P."N";
1254   IF K=15P."O";
1255   IF K=16P."P";
```

```
1256  IF K=17P."Q";
1257  IF K=18P."R";
1258  IF K=19P."S";
1259  IF K=20P."T";
1260  IF K=21P."U";
1261  IF K=22P."V";
1262  IF K=23P."W";
1263  IF K=24P."X";
1264  IF K=25P."Y";
1265  IF K=26P."Z";
1268  RET.
1270  F.X=401TO500:Y=RND(30)
1275  IF Y>13 THEN Y=0
1280  A(X)=Y:N.X
1285  F.X=501TO600:Y=RND(8010)
1290  A(X)=Y:N.X:RET.
1300  P."YOU CAME HOME WITHOUT ENOUGH
      BRETCHENKOEL?!?"
1305  GOS.2000
1310  P."YOU ARE PROMPTLY LYNCHED!":G.160
1320  IF A(A)=18 G.1330
1325  G.340
1330  IF A(B)=972 G.1340
1335  G.340
1340  P."HEY! ":GOS.2000
1345  P."YOU MUST'VE GONE THROUGH A BLACK HOLE OR"
1347  P."SOMETHING, BECAUSE SUDDENLY YOU'RE HOME!"
1350  GOS.2000:P."AND WHAT A GREETING YOU RECEIVE!"
1352  GOS.2000
1355  P."THE PEOPLE ALL GATHER AROUND AND SAY — "
1360  GOS.2000:G.1300
1370  P."NO SUCH PLANET!":P.:P.:F=RND(30):T=T+F
1375  IF F>23 THEN G.1390
1380  G.390
1390  P."YOU ARE HEREBY STRIPPED OF YOUR COMMAND!"
1395  GOS.2000:G.160
1400  P." 'EVENING STAR' IS DESTROYED!":GOS.2000
1410  G.1050
1500  M=RND(101)
1505  IF M>97 THEN G.1520
1510  RET
1520  P."METEOR STRIKE!!!":M=RND(34):T=T+M
1525  IF T>100 G.1100
1530  RET.
1600  P."YOU'VE DIVED INTO THE SUN!":GOS.2000
1610  G.1400
```

```
2000   Y=RND(1000)+100
2005   F.X= 1 TOY:N.X
2010   RET.
2100   U=RND(0):T=T+U
2110   IF T>100 G.1100
2120   RET.
```

Summary of Variables Used

A   Name selection/AFT/various
B   various
C   various
D   various
E   various
F   FORE/various
G   various
H   # of Thytherns
I   Not used
J   Bretchenkoel on board
K   Star name/distance
L   Timing
M   Timing
N   various
O   Planetary scan
P   # of planets/% of Bretchenkoel
Q   Planet #
R   Not used
S   various
T   energy used
U   various
V   Approach drive power
W   Planetary approach
X   Timing/various
Y   various
Z   Location/various

Sample Run (excerpt)

WARP DRIVE? 10
FORE OR AFT? FORE
****

YOU ARE 18 SECTORS FROM HOME
THE NEAREST STAR IS QB*19
DISTANCE IS 170 LIGHT YEARS
THERE ARE 5 PLANETS
THERE ARE 3 THYLTHERNS IN SOLAR SYSTEM
1 FOR SCAN — 2 FOR SOLAR APPROACH — 3 FOR WARP ? 1
                      SCANNING——
PLANET #1   21

```
PLANET #2        13
PLANET #3        37
PLANET #4        8
PLANET #5        25
3 FOR WARP, 4 FOR PLANETARY APPROACH? 3
                PLANETARY APPROACH
TARGET PLANET #? 3
DISTANCE TO PLANET #3 — 64
APPROACH DRIVE POWER? 2
DISTANCE TO PLANET #3 — 34
APPROACH DRIVE POWER? 2
TARGET ACHIEVED
CLOSE RANGE SCAN
ATMOSPHERE % OF BRETCHENKOEL — PLANET #3
                85%

LOADING---
1275 UNITS OF BRETCHENKOEL COLLECTED
TOTAL BRETENKOEL COLLECTED -- 2010
WARP DRIVE? 8
```

High Bid

This is a simple game. The instructions are included in the program and are self-explanatory.

At first glance it would seem that whoever went first would inevitably lose that round, but as you get in some practice you will learn how to use strategy to break up the tie games.

The sample run included is an early game without too much strategy being used. See Fig. 1-8 for the flowchart.

Standard BASIC

```
  5   PRINT " ", "HIGH BID":PRINT
 10   PRINT"WE EACH GET THE NUMBERS FROM 1 TO 10."
 15   PRINT"EACH # MAY BE PLAYED ONLY ONCE. ON EACH"
 20   PRINT"ROUND WE BOTH BID A # AND THE HIGH BID"
 25   PRINT"WINS THE ROUND. WHOEVER WON THE LAST"
 30   PRINT"ROUND GOES FIRST. THE FIRST ROUND WILL"
 32   PRINT"BE SELECTED RANDOMLY."
 35   REM* SET CHOICE ARRAYS & SCORE
 37   FOR X=1 TO 20
 40   LET A(X)=1
 42   NEXT X
 44   LET A=0:LET B=0
 46   REM* PLAYER SELECT
 48   FOR X=1 TO 470
 50   LET P=INT(RND(0)*2)+1
 52   NEXT X
 54   REM* SET COUNTER
 56   FOR T=1 TO 10
 58   IF P=1 THEN GOTO 180
 60   PRINT"I GO FIRST"
 62   GOSUB 120
 64   GOSUB 150
 66   GOSUB 170
 70   LET A(X)=0
 72   LET A(Y+10)=0
 75   IF X=Y THEN GOTO 205
 80   IF X>Y THEN GOTO 220
 85   PRINT"I WIN THIS ROUND"
 90   LET B=B+1
 92   LET P=2
 95   NEXT T
100   PRINT:PRINT"THE GAME IS OVER --- FINAL SCORE"
105   PRINT:PRINT"YOU","ME"
```
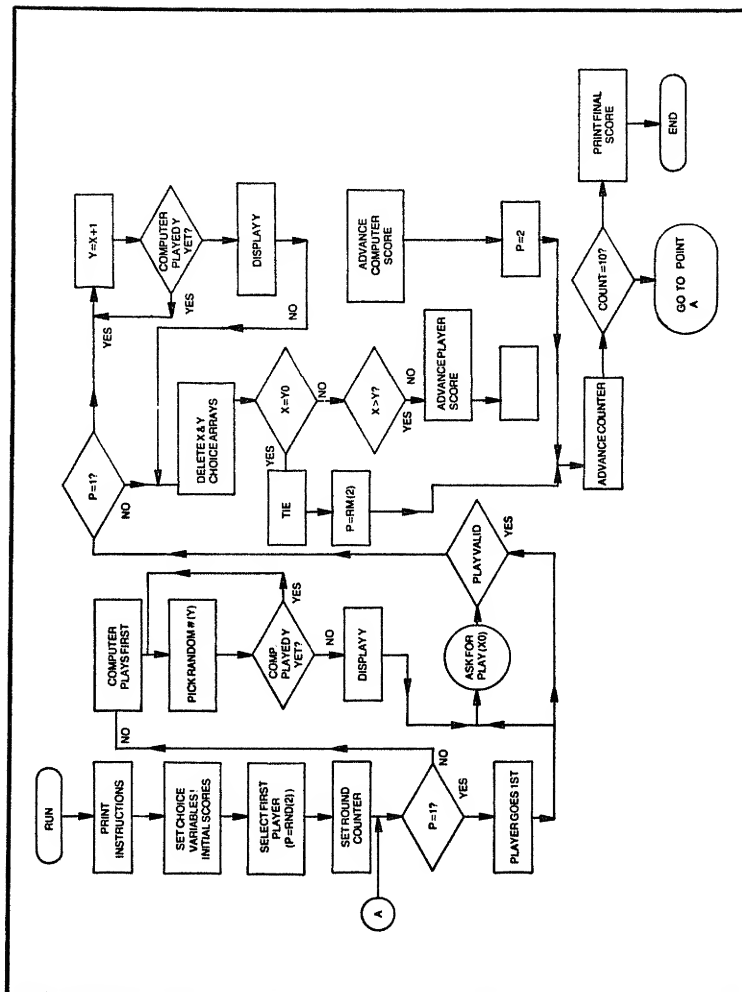
Fig. 1-8. High Bid flowchart.

```
110   PRINT A,B
115   END
120   PRINT "I PLAY --- ";
125   LET Y=INT(RND(0)*10)+1
130   IF A(Y+10)=0 THEN GOTO 125
135   FOR Z=1 TO 333: NEXT Z
137   PRINT Y
140   RETURN
150   PRINT"YOUR PLAY";
155   INPUT X
160   IF A(X)=0 THEN GOTO 155
165   RETURN
170   FOR Z=1 TO 400:NEXT Z
175   RETURN
180   PRINT"YOU GO FIRST"
185   GOSUB 150
190   GOSUB 120
195   GOSUB 170
200   GOTO 70
205   PRINT"TIE"
210   LET P=INT(RND(0)*2)+1
215   GOTO 95
220   PRINT"YOU WIN THIS ROUND"
225   LET A=A+1
230   LET P=1
235   GOTO 95
```

TRS-80 BASIC

```
  5   CLS:P." ","HIGH BID":P.
 10   P."WE EACH GET THE NUMBERS FROM 1 TO 10. EACH"
 15   P."# MAY BE PLAYED ONLY ONCE. ON EACH ROUND"
 20   P."WE BOTH BID A # AND THE HIGH BID WINS THE"
 25   P."ROUND. WHOEVER WON THE LAST ROUND GOES"
 30   P."FIRST. THE FIRST ROUND WILL BE SELECTED"
 32   P."RANDOMLY"
 35   F.X= 1TO20:A(X)=1:N.X:A=0:B=0
 40   F.X=1TO470:P=RND(2):N.X
 45   F.T=1TO10
 50   IF P=1 G.180
 55   P."I GO FIRST":GOS.120
 60   GOS.150
 65   GOS.170
 70   A(X)=0:A(Y+10)=0
 75   IF X=Y G.205
 80   IF X>Y G.220
```

```
85   P."I WIN THIS ROUND"
90   B=B+1:P=2
95   N.T
100  P.:P."GAME IS OVER --- FINAL SCORE":P.
105  P."YOU","ME"
110  P.A,B
115  END
120  P."I PLAY --- ";
125  Y=RND(10)
130  IF A(Y+10)=0 G.125
135  F.Z=1TO333:N.Z
140  P.Y:RET.
150  IN."YOUR PLAY";X
155  IF A(X)=0 G.150
160  RET.
170  F.Z=1TO400:N.Z:RET.
180  P."YOU GO FIRST"
185  GOS.150
190  GOS.120
195  GOS.170
200  G.70
205  P."TIE":P=RND(2)
210  G.95
220  P."YOU WIN THIS ROUND"
225  A=A+1:P=1
230  G.95
```

Sample Run

HIGH BID

WE EACH GET THE NUMBERS FROM 1 TO 10.
EACH # MAY BE PLAYED ONLY ONCE. ON EACH
ROUND WE BOTH BID A # AND THE HIGH BID
WINS THE ROUND. WHOEVER WON THE LAST
ROUND GOES FIRST. THE FIRST ROUND WILL
BE SELECTED RANDOMLY
I GO FIRST
I PLAY --- 7
YOUR PLAY?9
YOU WIN THIS ROUND
YOU GO FIRST
YOUR PLAY?3
I PLAY --- 4
I WIN THIS ROUND
I GO FIRST
I PLAY --- 2

YOUR PLAY?3
YOUR PLAY?2
TIE
I GO FIRST
I PLAY --- 5
YOUR PLAY?6
YOU WIN THIS ROUND
YOU GO FIRST
YOUR PLAY?1
I PLAY --- 3
I WIN THIS ROUND
I GO FIRST
I PLAY --- 10
YOUR PLAY?2
YOUR PLAY?4
I WIN THIS ROUND
I GO FIRST
I PLAY --- 8
YOUR PLAY?10
YOU WIN THIS ROUND
YOU GO FIRST
YOUR PLAY?8
I PLAY --- 9
I WIN THIS ROUND
I GO FIRST
I PLAY --- 6
YOUR PLAY?7
YOU WIN THIS ROUND
YOU GO FIRST
YOUR PLAY?5
I PLAY --- 1
YOU WIN THIS ROUND
GAME IS OVER --- FINAL SCORE
YOU   ME
  5   4

Summary of Variables Used

A   PLAYER'S SCORE
B   COMPUTER'S SCORE
P   PLAYER SELECT
T   TURN COUNTER
X   TIMING/PLAYER'S   BID
Y   COMPUTER'S BID

High Bid II

This game is essentially similar to the original *High Bid* game, but there is a greater element of chance to sustain continued interest.

Both the player and the computer still get ten numbers to play, but instead of a fixed 1 to 10, each of the numbers is selected randomly. Each number may be played only once each time it appears in your hand. To make things a little trickier, you are not told what numbers the computer is holding (it only looks at your hand when making a validity check, so the game is fair).

Since this game is played the same way as the other version, no sample run is included.

Standard BASIC

```
 5   PRINT:PRINT:PRINT
10   PRINT" ","HIGH BID II"
12   PRINT
14   FOR X=1 TO 20
16   LET A(X)=INT(RND(0)*10)+1
18   NEXT X
20   LET A=0:LET B=0:LET G=1
22   LET P=INT(RND(0)*2)+1
25   IF G>10 THEN GOTO 130
30   PRINT"YOUR HAND -- ";
32   FOR X=1TO 10
34   LET Y=A(X)
36   IF Y=0 THEN GOTO 40
38   PRINT Y;" ";
40   NEXT X:PRINT
45   IF P=1 THEN GOTO 200
50   PRINT"I GO FIRST"
55   LET X=11
60   IF A(X)>0 THEN GOTO 70
62   LET X=X+1
65   GOTO 60
70   LET Y=A(X)
75   LET A(X)=0
80   PRINT "I'LL PLAY -- ";
85   GOSUB 330
90   PRINT Y
95   GOSUB 275
100  IF X=Y THEN GOTO 150
105  IF X>Y THEN GOTO 170
```

```
110  PRINT "I WIN THIS ROUND"
112  LET B=B+1
114  LET P=2
116  LET G=G+1
118  GOSUB 330
120  GOTO 25
130  PRINT:PRINT"GAME IS OVER — FINAL SCORE"
135  PRINT"YOU","ME"
140  PRINT A,B
145  END
150  PRINT"TIE"
155  LET P=INT(RND(0)*2)+1
160  GOTO 116
170  PRINT"YOU WIN THIS ROUND"
175  LET A=A+1
180  LET P=1
185  GOTO 116
200  PRINT"YOU GO FIRST"
202  GOSUB 275
204  LET Y=X+1
206  LET C=0
208  PRINT"I'LL PLAY --- ";
210  IF Y=11 THEN Y=1
215  FOR Z=11 TO 20
220  IF A(Z)=Y THEN C=Z
225  NEXT Z
230  IF C>0 THEN GOTO 250
235  LET Y=Y+1
240  GOTO 210
250  LET A(C)=0
255  PRINT Y
260  GOSUB 330
265  GOTO 100
275  PRINT"YOUR PLAY";
280  INPUT X
285  LET C=0
290  FOR Z=1TO10
295  IF A(Z)=X THEN LET C=Z
300  NEXT Z
305  IF C>0 THEN GOTO 320
310  PRINT"INVALID PLAY"
315  GOTO 275
320  LET A(C)=0
330  FOR Z=1 TO 333
335  NEXT Z
340  RETURN
```

```
  5   CLS:P." ","HIGH BID IT":P.
 10   F.X=1TO20:A(X)=RND(10):N.X.
 15   P=RND(2):A=0:B=0:G=1
 20   IF G<10 G. 130
 25   ."YOUR HAND --- ";
 30   F.X=1TO 10:Y=A(X):IF Y=0 G. 40
 35   P.Y;" ";
 40   N.X.:P.
 50   IF P=1 G. 200
 55   P." I GO FIRST":X=11
 60   IF A(X)>0 G. 70
 65   X=X+1:G.60
 70   Y=A(X):A(X)=0
 75   P."I'LL PLAY --- ";
 80   GOS. 320
 85   P.Y
 90   GOS. 275
100   IF X=Y G. 150
105   IF X>Y G. 170
110   P."I WIN THIS ROUND"
115   B=B+1:P=2
120   G=G+1:GOS.320
125   G.20
130   P.:P."GAME IS OVER --- FINAL SCORE"
135   P."YOU","ME"
140   P.A,B
145   END
150   P."TIE"
155   P=RND(2)
160   G.120
170   P."YOU WIN THIS ROUND"
175   A=A+1:P=1:G.120
200   P."YOU GO FIRST"
205   GOSUB 275
210   Y=X+1:C=0:P."I'LL PLAY --- ";
215   IF Y=11 THEN Y=1
220   F.Z=11 TO 20
225   IF A(Z)=Y THEN C=Z
230   N.Z
235   IF C>0 G. 250
240   Y=Y+1:G. 215
250   A(C)=0
255   P.Y
260   GOS. 320
265   G. 100
```

```
275   IN."YOUR PLAY";X
280   C=0:F.Z=1TO 10
285   IF A(Z)=X THEN C=Z
290   N.Z
295   IF C>0 G. 310
300   P. "INVALID PLAY"
305   G.275
310   A(C)=0
320   F.Z=1TO333:N.Z
325   RET.
```

Balancing The Scales

This game is simple in concept, but playing it can be quite tricky. The computer gives you 25 weights of up to 10 grams each, and you have to place them all on a four-way scale arranged like this:

<div align="center">

A

C D

B

</div>

If two opposite plates (A and B or C and B) have more than a 5 gram difference, the scale assembly will topple over. Also, if the two crossbeams (A+B and C+D) have more than a 7.5 gram difference, the scale will topple.

If you manage to get all 25 weights on the scale without toppling it, you win. If the scale topples, you lose.

An additional note: once a weight has been placed on the scale, it can't be moved. See Fig. 1-9 for the flowchart.

Standard BASIC

```
  5   PRINT:PRINT
  7   PRINT" "," BALANCING THE SCALES":PRINT
 10   REM * SET WEIGHTS & CLEAR SCALE *
 12   FOR X=1 TO 25
 15   LET Y=INT (RND(0)*100)+1
 17   LET Y=Y/10:LET A(X)=Y
 20   NEXT X
 22   LET A=50:LET B=60
 25   LET C=70:LET D=80
 30   LET E=0:LET F=0
 32   LET G=0:LET H=0
 35   REM * THE PLAY *
 37   FOR X=1 TO 470:PRINT:NEXT X
 40   PRINT "THE AVAILABLE WEIGHTS ARE",
 42   FOR X=1 TO 25
 45   PRINT X;"*";A(X);" ";
 47   NEXT X
 50   PRINT:PRINT:PRINT"SCALE RANKING"
 55   LET X=10
 60   IF E=X THEN PRINT "A---";X,
 65   IF F=X THEN PRINT"B--";X,
 70   IF G=X THEN PRINT"C--";X,
 75   IF H=X THEN PRINT"D---";X,
 80   IF X=0 THEN GOTO 90
 82   LET X=X-.1
```

```
85   GOTO 60
90   PRINT "WHICH WEIGHT?"
92   INPUT W
95   IF W>25 THEN GOTO 135
100  IF A(W)=0 THEN GOTO 135
105  PRINT "WHICH SCALE?"
107  INPUT S
110  FOR X=1 TO 390:NEXT X
115  IF S=A THEN GOTO 140
120  IF S=B THEN GOTO 145
125  IF S=C THEN GOTO 150
130  IF S=D THEN GOTO 155
135  REM* INVALID ENTRY*
137  PRINT "DON'T GET CUTE, PAL!"
138  GOTO 90
140  LET E=E+A(W)
142  GOTO 160
145  LET F=F+A(W)
147  GOTO 160
150  LET G=G+A(W)
152  GOTO 160
155  LET H=H+A(W)
160  LET A(W)=0
162  REM* TOPPLE CHECK*
165  IF E>(F+5) THEN GOTO 250
170  IF F>(E+5) THEN GOTO 250
175  IF G>(H+5) THEN GOTO 250
180  IF H>(G+5) THEN GOTO 250
185  LET I=E+F:LET J=G+H
190  IF I>(J+7.5) THEN GOTO 250
195  IF J>(I+7.5) THEN GOTO 250
200  REM* REMAINING WEIGHT CHECK*
202  LET Y=0
205  FOR X=1 TO 25
207  LET Y=Y+A(X)
210  NEXT X
212  IF Y=0 THEN GOTO 225
215  GOTO 35
225  PRINT "THAT WAS THE LAST WEIGHT":PRINT
230  FOR X=1 TO 333:NEXT X
235  PRINT "YOU WIN!"
240  END
250  PRINT "SCALE STRUCTURE TOPPLES!":PRINT
255  FOR X=1 TO 333:NEXT X
260  PRINT "YOU LOSE!"
265  END
```

100
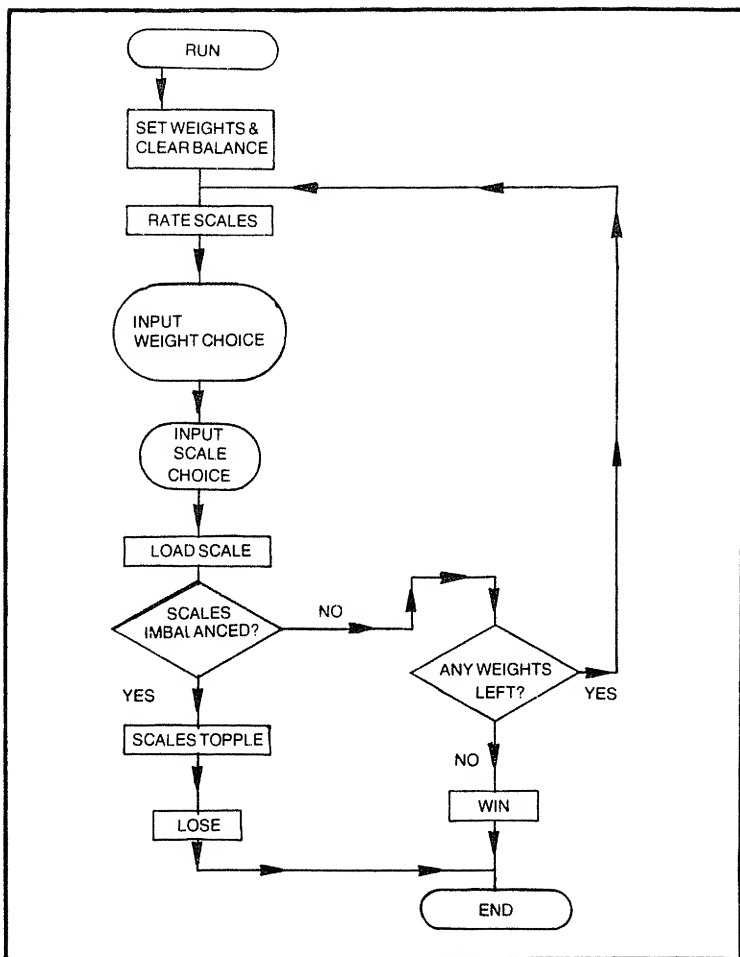
Fig. 1-9. Flowchart for Balancing the Scales.

TRS-80 BASIC

```
10  CLS:P.P:.P" ",BALANCING THE SCALES":P.
15  F.X=1TO25
20  Y=RND (100)/10:A(X)=Y
25  N.X:A=50:B=60:C=70
30  D=80:E=0:F=0:G=0:H=0
35  F.X=1TO470:N.X
40  CLS:P."THE AVAILABLE WEIGHTS ARE",
45  F.X=1TO 25:P.X;"*";A(X);" ";
50  N.X:P.:P.:P."SCALE RANKING
55  X=10
```

```
60    IF E=X P. "A—";X,
65    IF F=X P. "B—";X,
70    IF G=X P. "C—";X,
75    IF H= X P. "D—";X,
80    IF X=0 G.90
85    X=X−.1:G.60
90    IN. "WHICH WEIGHT";W
95    IF W>25 G. 135
100   IF A(W)=0 G.135
105   IN. "WHICH SCALE";S
110   F.X=1TO390:N.X
115   IF S=A G.140
120   IF S=B G.145
125   IF S=C G.150
130   IF S=D G.155
135   P. "DON'T GET CUTE, PAL!":G.90
140   E=E+A(W)::G.160
145   F=F+A(W):G.160
150   G=G+A(W):G.160
155   H=H+A(W)
160   A(W)=0
165   IF E>(F+5) G.250
170   IF F>(E+5) G.250
175   IF G>(H+5) G.250
180   IF H>(G+5) G.250
185   I=E+F:J=G+H
190   IF I>(J+7.5) G.250
195   IF J>(I+7.5) G.250
200   Y=0:F.X=1TO 25
205   Y=Y+A(X):N.X
210   IF Y=0 G.225
215   G.35
225   P. "THAT WAS THE LAST WEIGHT":P.
230   F.X=1TO333:N.X
235   P. "YOU WIN!"
240   END
250   PRINT "SCALE STRUCTURE TOPPLES!"
255   F.X=1TO333:N.X
260   P. "YOU LOSE!"
265   END
```

Summary Of Variables Used

A,B,C,D	Scale positions
E	Weight of scale A
F	Weight of scale B
G	Weight of scale C

H	Weight of scale D
I	Weight of crossbar AB
J	Weight of crossbar CD
S	Scale choice
W	Weight choice
X	Timing
Y	Various

Sample Run

BALANCING THE SCALES

THE AVAILABLE WEIGHTS ARE   1*3.3 2*7 3*2.9
4*5.5 5*8 6*7.1 7*7.7 8*9.6 9*6.2 10*1.7
11*8.1 12*1.9 13*4 14*3.8 15*6.5 16*8.8
17*9.4 18*2.6 19*7 20*4.2 21*7.9 22*5.3
23*1 24*0.7 25* 6.2
SCALE RANKING
A--0   B--0   C--0   D--0
WHICH WEIGHT? 1__
WHICH SCALE? A__

THE AVAILABLE WEIGHTS ARE   1*0 *7.3 *2.9
4*5.5 5*8 6*7.1 7*7.7 8*9.6 9*6.2 10*1.7
11*8.1 12*1.9 13*4 14*3.8 15*6.5 16*8.8
17*9.4 18*2.6 19*7 20*4.2 21*7.9 22*5.3
23*1 24*0.7 25*6.2
SCALE RANKING
A--3.3   B--0   C--0   D--0
WHICH WEIGHT? 1_
DON'T GET CUTE, PAL!
WHICH WEIGHT? 3_
WHICH SCALE? C__

THE AVAILABLE WEIGHTS ARE...
        (from here on I won't bother repeating the
        weights. When a weight is used it becomes
        0.)
SCALE RANKING
A--3.3   C--2.9   B--0   D--0
WHICH WEIGHT? 4_
WHICH SCALE? B__

THE AVAILABLE WEIGHTS ARE   ...
SCALE RANKING

B--5.5   A--3.3   C--2.9   D--0
WHICH WEIGHT? 2
WHICH SCALE? D—

THE AVAILABLE WEIGHTS ARE   ...
SCALE RANKING
D--7   B--5.5   A--3.3   C--2.9
WHICH WEIGHT? 5
WHICH SCALE? A—
SCALE STRUCUTRE TOPPLES!
YOU LOSE!

Memory Test

You have to keep alert to win this two-player game. There are 10 rounds. On each round three numbers are separately flashed on the screen for a brief period of time (which gets progressively shorter on each round). If you want to alter the flash time, change the value of C in line 35.

After displaying the three numbers, the computer asks one of the players (randomly selected) to repeat one of the numbers. Then the other player is asked for one of the remaining numbers. A correct entry by either player scores a point for that player.

After 10 rounds the total score for both players is displayed and the game ends.

In the easy level the numbers can be up to three digits. The medium level numbers go up to four digits, and the hard numbers have up to five digits.

Since this is a memory game, there would be no point in including a sample run. See Fig. 1-10 for the flowchart.

Standard BASIC

```
 5   PRINT:PRINT:PRINT
10   PRINT" "," MEMORY TEST":PRINT
12   PRINT"PLAYER #1";
15   INPUT A$
17   PRINT"PLAYER #2";
20   INPUT B$
25   LET A=0:LET B=0
30   LET E=10:LET M=100:LET H=1000
35   LET C=150
40   PRINT"EASY, MEDIUM OR HARD GAME ";
45   INPUT G
50   REM* BEGIN THE PLAY *
55   FOR K=1 TO 10
57   LET X=INT(RND(0)*100)*INT(RND(0)*G)
60   LET Y=INT(RND(0)*100)*INT(RND(0)*G)
62   LET Z=INT(RND(0)*100)*INT(RND(0)*G)
65   PRINT"ENTER 1 WHEN READY "
70   INPUT J
72   REM* FLASH NUMBERS*
75   LET M=INT(RND(0)*888)+1
77   FOR N=1 TO M:NEXT N
80   FOR N=1 TO 50:PRINT:NEXT N
```

```
82    PRINT X
85    FOR D=1 TO C:NEXT D
87    FOR N=1TO 50:PRINT:NEXT N
90    PRINT Y
92    FOR D=1 TO C:NEXT D
95    FOR N=1 TO 50:PRINT:NEXT N
97    PRINT Z:M=M+100
100   FOR D=1TO C:NEXT D
105   FOR N=1 TO M:PRINT:NEXT N
110   LET T=INT(RND(0)*2)
115   IF T=1 THEN GOTO 155
120   PRINT A$;" WHAT WAS THE ";
122   LET F=0
125   LET H=INT(RND(0)*3)+1
130   IF H=1 THEN GOSUB 200
135   IF H=2 THEN GOSUB 220
140   IF H=3 THEN GOSUB 240
145   LET A=A+F
150   IF T=1 THEN GOTO 195
155   PRINT B$;" WHAT WAS THE ";
157   LET F=0
160   LET I=INT(RND(0)*3)+1
165   IF I=H THEN GOTO 160
170   IF I=1 THEN GOSUB 200
175   IF I=2 THEN GOSUB 220
180   IF I=3 THEN GOSUB 240
185   LET B=B+F
190   IF T=1 THEN GOTO 120
195   NEXT K
197   GOTO 275
200   PRINT"FIRST NUMBER";
202   INPUT W
205   IF W=X THEN GOTO 260
210   PRINT"NO, IT WAS ";X
215   RETURN
220   PRINT"SECOND NUMBER";
222   INPUT W
225   IF W=Y THEN GOTO 260
230   PRINT"NO, IT WAS ";Y
235   RETURN
240   PRINT"THIRD NUMBER";
242   INPUT W
245   IF W=Z THEN GOTO 260
250   PRINT"NO, IT WAS ";Z
255   RETURN
260   PRINT"CORRECT"
```

```
265   LET F=1
270   RETURN
275   PRINT "GAME IS OVER"
280   PRINT A$;" GOT ";A;"RIGHT"
285   PRINT "AND ";B$;" GOT ";B
290   END
```

TRS-80 BASIC

```
 10   CLS:P.:P." ","MEMORY TEST":P.
 15   IN."PLAYER #1";A$
 20   IN."PLAYER #2";B$
 25   E=10:M=100:H=1000
 30   IN."EASY, MEDIUM OR HARD GAME";G
 35   A=0:B=0:C=150
 50   F.K=1TO10
 55   X=RND(100)*RND(G)
 60   Y=RND(100)*RND(G)
 65   Z=RND(100)*RND(G)
 70   IN."ENTER 1 WHEN READY";J
 75   M=RND(888):F.N=1TOM:N.N
 80   CLS:P.X
 85   F.D=1TO C:N.D
 90   CLS:P.Y
 95   F.D=1TO C:N.D
100   CLS:P.Z
105   F.D=1TO C:N.D:C=C-10
110   CLS:T=RND(2):F.N=1TOM:N.N
115   IF T=1 G.155
120   P.A$;" WHAT WAS THE ";
125   H=RND(3):F=0
130   IF H=1 GOS.200
135   IF H=2 GOS. 220
140   IF H=3 GOS. 240
145   A=A+F
150   IF T=1 G.195
155   P.B$;" WHAT WAS THE ";
160   I=RND(3):F=0
165   IF I=H G. 160
170   IF I=1 GOS.200
175   IF I=2 GOS.220
180   IF I=3 GOS. 240
185   B=B+F
190   IF T=1 G.120
195   N.K:G.275
200   IN."FIRST NUMBER";W
205   IF W=X G.260
```

```
210   P."NO, IT WAS ";X
215   RET.
220   IN."SECOND NUMBER";W
225   IF W=Y G. 260
230   P."NO, IT WAS ";Y
235   RET.
240   IN."THIRD NUMBER";W
245   IF W=Z G.260
250   P."NO, IT WAS ";Z
255   RET.
260   P."CORRECT":F=1
265   RET.
275   P."GAME IS OVER"
280   P.A$;" GOT ";A;" RIGHT AND ";B$;" GOT ";B
285   END
```

Summary of Variables Used

A$ Player #1
B$ Player #2
A   A$ score
B   B$ score
C   Flash timing
D   Flash timing
E   Easy game
F   Correct guess?
G   Game level
H   Hard game/A$ number selection
I   B$ number selection
J   Round start
K   Round counter
M   Medium game/Timing
N   Timing
T   Player select
W   Guess
X   First number
Y   Second number
Z   Third number

What Comes Next

If you enjoy solving mathematical puzzles, this game is for you. The computer generates a sequence of numbers in the pattern of $A = ((A+B)*C) - D$. It gives you the first three numbers in the sequence and you have to figure out what the next number will be. If you guess wrong the computer will give you the correct number, and you must determine the next step in the sequence. Once you correctly identify a number, the game moves on to the next sequence. If you have no idea what the next number might be you can enter "E" to pass. An E counts as a half try.

The computer keeps track of how many tries it takes you to get through ten sequences. Obviously, the lower your score, the better. See Fig. 1-11 for the flowchart.

Standard BASIC

```
 5   LET S=0
10   FOR X=1 to 10
12   LET T=1
14   LET A=INT(RND(0)*10)+1
16   LET B=INT(RND(0)*100)+1
18   LET Z=INT(RND(0)*10)+1
20   IF Z>6 THEN LET B=0
22   LET C=INT(RND(0)*50)+1
24   LET Z=INT(RND(0)*10)+1
26   IF Z>4 THEN LET C=1
28   LET D=INT(RND(0)*25)+1
30   LET Z=INT(RND(0)*10)+1
35   IF Z>3 THEN LET D=1
40   REM* DISPLAY INITIAL SERIES*
45   FOR Y=1 TO 3
50   PRINT A,
55   LET A=((A+B)*C)-D
60   NEXT Y
65   PRINT
70   REM* PLAYER'S GUESS *
72   LET E=0.5
75   PRINT"WHAT COMES NEXT? (ENTER E TO PASS)";
77   INPUT F
80   IF F=E THEN GOTO 95
85   IF F=A THEN GOTO 110
90   PRINT "INCORRECT",
92   LET T=T+0.5
```

```
 95   LET T=T+0.5
 97   LET A=((A+B)*C)-D
100   PRINT A
105   GOTO 70
110   PRINT"CORRECT!",T;"TRIES"
115   LET S=S+T
120   PRINT"YOUR SCORE SO FAR IS";S
125   NEXT X
130   PRINT"GAME OVER"
135   IF S<13 THEN GOTO 160
140   IF S<20 THEN GOTO 170
145   IF S>30 THEN GOTO 180
150   END
160   PRINT"FANTASTIC!"
165   END
170   PRINT"VERY GOOD"
175   END
180   PRINT"FRANKLY, YOU DID LOUSY"
185   END
```

TRS-80 BASIC

```
 10   S=0
 15   F.X=1TO10:T=1
 20   A=RND(10):B=RND(100):Z=RND(10)
 25   IF Z>6 THEN B=0
 30   C=RND(50):Z=RND(10)
 35   IF Z>4 THEN C=1
 40   D=RND(25):Z=RND(10)
 45   IF Z>3 THEN D=1
 50   F.Y=1TO3
 55   P.A,
 60   A=((A+B)*C)-D
 65   N.Y
 70   P.:E=0.5
 75   IN."WHAT COMES NEXT? (ENTER E TO PASS)";F
 80   IF F=E G.95
 85   IF F=A G.110
 90   P."INCORRECT",:T=T+0.5
 95   T=T+0.5:A=((A+B)*C)-D
100   P.A:G.70
110   P."CORRECT",T;" TRIES"
115   S=S+T:P."YOUR SCORE SO FAR IS";S
120   N.X
125   IF S<13 G.150
130   IF S<20 G.160
135   IF S>30 G.170
```

```
145  END
150  P. "FANTASTIC!"
155  END
160  P. "VERY GOOD"
165  END
170  P. "FRANKLY, YOU DID LOUSY."
175  END
```
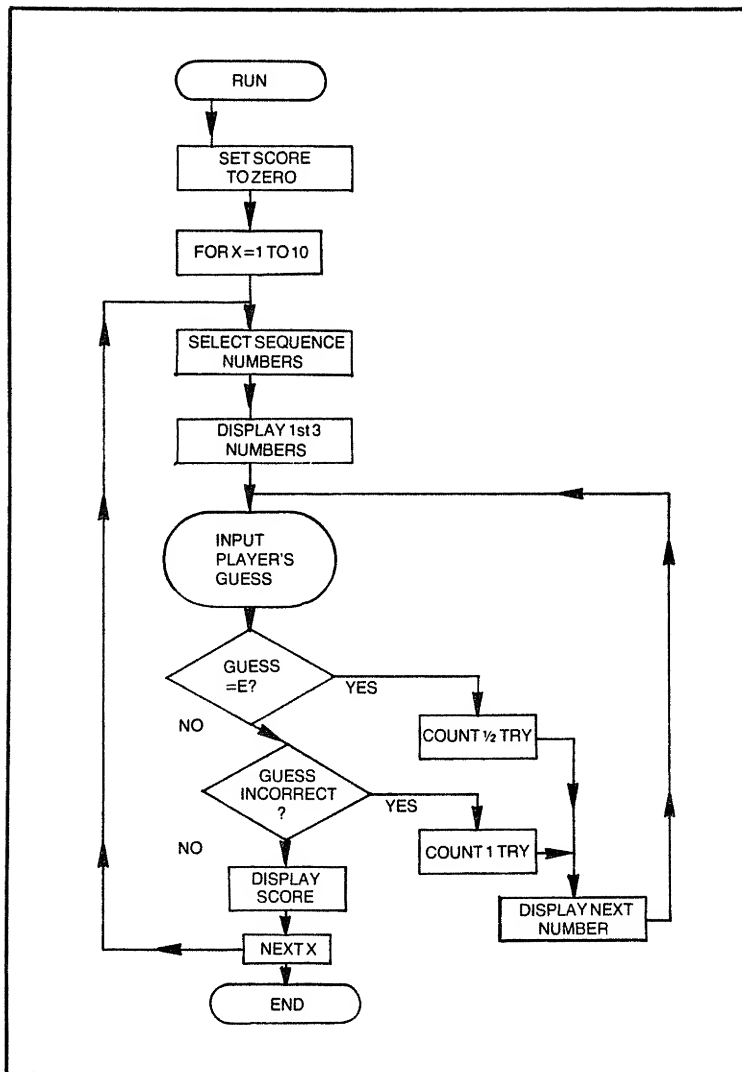

Fig. 1-11. Flowchart for What Comes Next.

Sample Run (excerpt)

```
7    99       111
WHAT COMES NEXT? (ENTER E TO PASS)? 222222
INCORRECT     11143
WHAT COMES NEXT? (ENTER E TO PASS)? 111595
CORRECT!      2 TRIES
YOUR SCORE SO FAR IS 2
3    2    1
WHAT COMES NEXT? (ENTER E TO PASS)? 0
CORRECT!      1 TRIES
YOUR SCORE SO FAR IS 3
9    17     33
WHAT COMES NEXT? (ENTER E TO PASS)? 66
INCORRECT     65
WHAT COMES NEXT? (ENTER E TO PASS)? E
129
WHAT COMES NEXT? (ENTER E TO PASS) ?357
CORRECT!      2.5 TRIES
YOUR SCORE SO FAR IS 5.5
10   968    10538
WHAT COMES NEXT? (ENTER E TO PASS)? 11428
INCORRECT     106238
WHAT COMES NEXT? (ENTER E TO PASS)? E
1063238
WHAT COMES NEXT? (ENTER E TO PASS)? 1063328
CORRECT!      2.5 TRIES
YOUR SCORE SO FAR IS 8
```

Summary of Variables Used

A-D	SEQUENCE VARIABLES
E	PASS
F	PLAYER'S GUESS
S	TOTAL SCORE
T	ROUND SCORE
X	ROUND COUNT
Y	TIMING
Z	VARIOUS

Go Fish

Here's a computerized version of a popular card game. The "deck" consists of up to four each of 16 different card types, identified by the letters A through P. The object is to make as many matches as possible.

On each play you are shown the cards in your hand and the number of cards in the computer's hand. You first make any matches you can (and the computer does likewise); then you request a card. If the computer has it, the card is exchanged. If not, you take the top card from the main deck. Then the computer takes a similar turn (it does not examine your hand until after it has made its request, so it doesn't cheat).

The game is over when either of the players has no cards in hand, or when the main deck runs out of cards. The winner is the player with the highest number of matches. All card values count the same. See Fig. 1-12 for the flowchart.

Standard BASIC

```
 3   FOR X=1 TO 302
 5   PRINT
 7   LET A(X)=0
10   NEXT X
12   PRINT" "," GO FISH":PRINT
15   FOR X=1 TO 4
17   FOR Y=1 TO 16
20   LET Z=INT(RND(0)*100)+201
22   IF A(Z)>0 THEN GOTO 20
25   LET A(Z)=Y
27   NEXT Y
30   NEXT X
31   LET Q=200
32   LET A=1:LET B=2
33   LET C=3:LET D=4
34   LET E=5:LET F=6
35   LET G=7:LET H=8
36   LET I=9:LET J=10
37   LET K=11:LET L=12
38   LET M=13:LET N=14
39   LET O=15:LET P=16
40   REM*OPENING DEAL*
42   FOR X=1 TO 7
45   LET Q=Q+1
46   IF A(Q)=0 THEN GOTO 45
47   LET A(X)=A(Q):LET A(Q)=0
```

```
48    NEXT X
50    FOR X=101 TO 107
51    LET Q=Q+1
52    IF A(Q)=0 THEN GOTO 51
53    LET A(X)=A(Q):LET A(Q)=0
54    NEXT X
55    REM*THE PLAY*
57    PRINT:PRINT"YOUR HAND----";
60    FOR X=1 TO 100:LET Y=A(X)
62    IF Y>0 THEN GOSUB 240
64    NEXT X
66    PRINT:PRINT:PRINT"MY HAND---";
68    FOR X=101 TO 200
70    LET Y=A(X)
72    IF Y=0 THEN GOTO 80
74    LET Z=X-100
76    PRINT Z;".)X";
78    NEXT X
80    PRINT:PRINT
82    GOTO 335
85    PRINT"WHAT DO YOU NEED";
87    INPUT S
90    FOR X=101 TO 200
92    LET Y=A(X)
94    IF Y=S THEN LET T=X
96    NEXT X
98    IF T>0 THEN GOTO 470
100   PRINT"GO FISH!"
102   FOR Z=1TO 470:NEXT Z
104   PRINT:PRINT
106   LET Y=A(Q)
108   IF Y=0 THEN GOSUB 530
110   LET A(Q)=0:LET X=1:LET Q=Q+1
112   IF A(X)=0 THEN GOTO 120
115   LET X=X+1
117   GOTO 112
120   LET A(X)=Y
122   PRINT"YOU DREW A";
124   GOSUB 245
126   PRINT:PRINT
128   GOSUB 330
130   PRINT"I NEED A";
132   LET X=200
135   IF A(X)>0 THEN GOTO 145
140   LET X=X-1
142   GOTO 135
```
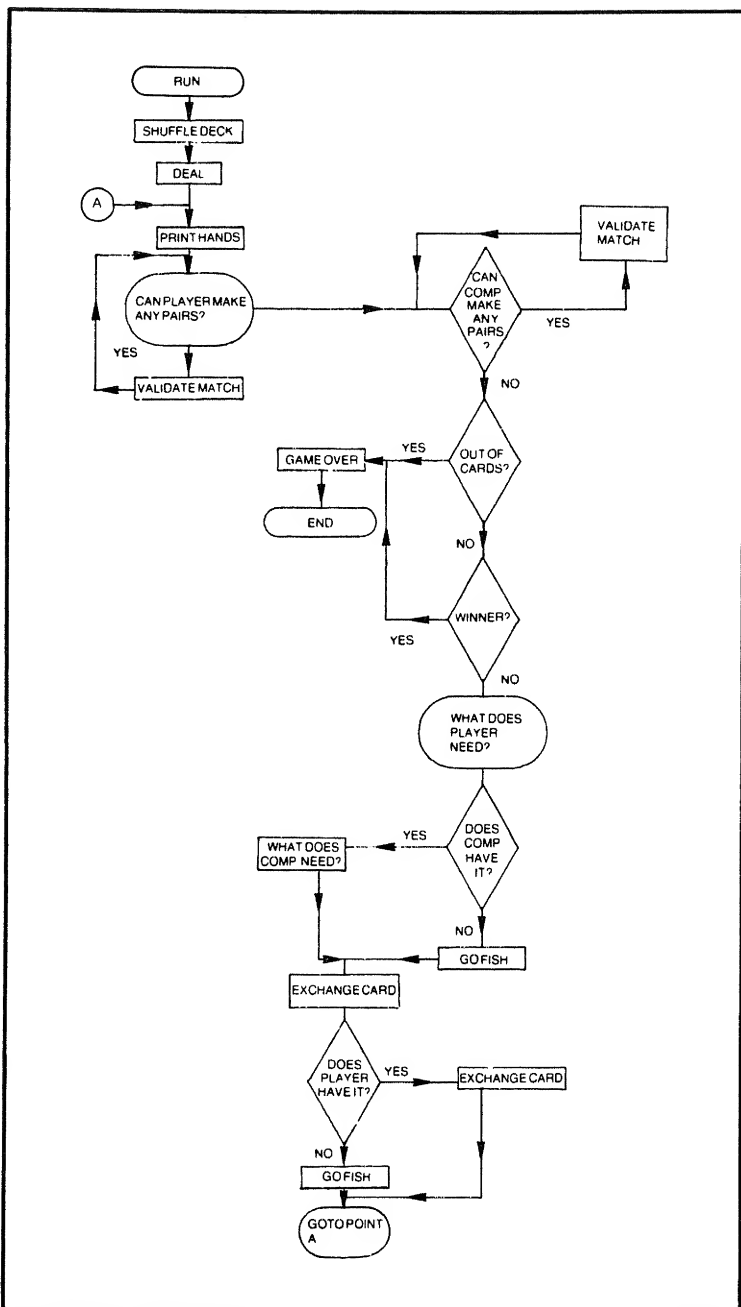
Fig. 1-12. Flowchart for Go Fish.

```
145   LET Y=A(X)
146   GOSUB 245
148   PRINT
150   LET T=0
152   FOR X=1 TO 100
154   LET S=A(X)
156   IF S=Y THEN LET T=X
158   NEXT X
160   GOSUB 330
165   IF T>0 THEN GOTO 490
167   PRINT"I MUST GO FISH"
170   LET Y=A(Q):LET X=101
172   IF Y=0 THEN GOSUB 530
174   LET A(Q)=0:LET Q=Q+1
176   IF A(X)=0 THEN GOTO 185
178   LET X=X+1
180   GOTO 176
185   LET A(X)=Y
190   GOSUB 330
195   GOSUB 330
200   GOTO 55
240   PRINT X;".)";
245   IF Y=1 THEN PRINT "A ";
250   IF Y=2 THEN PRINT"B ";
255   IF Y=3 THEN PRINT"C ";
260   IF Y=4 THEN PRINT"D ";
265   IF Y=5 THEN PRINT"E ";
270   IF Y=6 THEN PRINT"F ";
275   IF Y=7 THEN PRINT "G ";
280   IF Y=8 THEN PRINT"H ";
285   IF Y=9 THEN PRINT "I ";
290   IF Y=10 THEN PRINT "J ";
295   IF Y=11 THEN PRINT "K ";
300   IF Y=12 THEN PRINT "L ";
305   IF Y=13 THEN PRINT "M ";
310   IF Y=14 THEN PRINT "N ";
315   IF Y=15 THEN PRINT "O ";
320   IF Y=16 THEN PRINT "P ";
325   RETURN
330   FOR Z=1 TO 555:NEXT Z
333   RETURN
335   LET Y=50:LET N=14
337   PRINT"CAN YOU MATCH ANY PAIRS";
340   INPUT U
342   IF U=N THEN GOTO 380
344   PRINT "CARD#";
```

```
346    INPUT S
348    PRINT "AND CARD#";
350    INPUT T
352    IF A(S)= THEN GOTO 360
354    IF S=T THEN GOTO 360
356    IF A(S)=A(T) THEN GOTO 365
360    PRINT "INVALID MATCH"
362    GOTO 335
365    LET Y=A(S):LET A(S)=0
367    LET A(T)=0:LET T=A(301)
370    LET T=T+1:LET A(301)=T
372    PRINT "YOU'VE MATCHED A PAIR OF";
374    GOSUB 245
376    GOTO 335
380    FOR X=101 TO 200:LET R=A(X)
382    IF R=0 THEN GOTO 400
385    FOR Z=101 TO 200
387    IF Z=X THEN GOTO 395
390    LET S=A(Z)
392    IF R=S THEN GOSUB 430
395    NEXT Z
400    NEXT X
402    IF Q>275 THEN GOTO 465
405    LET W=0
407    FOR X=1 TO 200:LET W=W+A(X)
410    NEXT X
412    IF W=0 THEN GOTO 440
415    LET W=0
417    FOR X=101 TO 200:LET W=W+A(X)
420    NEXT X
422    IF W=0 THEN GOTO 460
425    LET T=0
427    GOTO 85
430    LET Y=R
432    PRINT "I'VE MATCHED A PAIR OF";
434    GOSUB 245
436    LET R=-5:LET A(X)=0:LET A(Z)=0
438    LET T=A(302):LET T=T+1:LET A(302)=T
439    RETURN
440    PRINT "YOU ARE OUT OF CARDS"
442    LET X=A(301):LET Y=A(302)
444    PRINT "YOU MATCHED";X;"PAIRS"
446    PRINT "AND I MATCHED";Y;"PAIRS"
450    END
460    PRINT "I AM OUT OF CARDS"
462    GOTO 442
```

```
465   PRINT"THE DECK IS OUT OF CARDS"
467   GOTO 442
470   LET A(T)=0
472   FOR X=1 TO 100
475   IF A(X)=0 THEN GOTO 485
480   NEXT X:PRINT:PRINT
482   GOSUB 330
484   GOTO 130
485   LET A(X)=S:LET S=0
487   GOTO 480
490   LET A(T)=0
495   FOR X=1 TO 100
500   IF A(X)=0 THEN GOTO 515
505   NEXT X
507   GOSUB 330
510   GOTO 70
515   LET A(X)=S
520   LET S=0
525   GOTO 505
530   LET Q=Q+1
535   LET Y=A(Q)
540   IF Y=0 THEN GOTO 530
545   RETURN
```

TRS-80 BASIC

```
10   CLS:P.:P." ","GO FISH":F.X=1TO302
15   A(X)=0:N.X
20   F.X=1TO4:F.Y=1TO16
25   Z=RND(100)+200
30   IF A(Z)>0 G.25
35   A(Z)=Y:N.Y:N.X:Q=200
40   F.X=1TO7
42   Q=Q+1
44   IF A(Q)=0 G.42
46   A(X)=A(Q):A(Q)=0:N.X
48   F.X=101 TO 107
50   Q=Q+1
52   IF A(Q)=0 G.50
54   A(X)=A(Q):A(Q)=0:N.X
55   CLS:P."YOUR HAND---";:F.X=1 TO 100:Y=A(X)
60   IF Y>0 GOS.240
65   N.X:P.:P.:P."MY HAND---";
67   F.X=101TO200:Y=A(X)
70   IF Y=0 G.80
75   Z=X-100:P.Z;".)X";
80   N.X:P.:P.:G.335
```

```
85   IN."WHAT DO YOU NEED";S
90   F.X=101 TO 200:Y=A(X)
92   IF Y=S THEN T=X
95   N.X:IF T>0 G.470
100  P."GO FISH!":F.Z=1TO470:N.Z:P.:P.
102  Y=A(Q)
105  IF Y=0 GOS.530
107  A(Q)=0:X=1:Q=Q+1
110  IF A(X)=0 G.120
115  X=X+1:G.110
120  A(X)=Y:P."YOU DREW A";:GOS.245
125  P.:P.:GOS.330
130  P."I NEED A";:X=200
135  IF A(X)>0 G.145
140  X=X-1:G.135
145  Y=A(X):GOS.245:P.:P.
150  T=0:F.X=1TO100:S=A(X)
155  IF S=Y THEN T=X
160  N.X:GOS.330
165  IF T>0 G.490
170  P."I MUST GO FISH":Y=A(Q)
172  IF Y=0 GOS.530
176  A(Q)=0:X=101:Q=Q+1
178  IF A(X)=0 G.185
180  X=X+1:G.178
185  A(X)=Y:GOS.330
190  G.55
240  P.X;".)";
245  IF Y=1 P."A";
250  IF Y=2 P."B";
255  IF Y=3 P."C";
260  IF Y=4 P."D";
265  IF Y=5 P."E";
270  IF Y=6 P."F";
275  IF Y=7 P."G";
280  IF Y=8 P."H";
285  IF Y=9 P."I";
290  IF Y=10 P."J";
295  IF Y=11 P."K";
300  IF Y=12 P."L";
305  IF Y=13 P."M";
310  IF Y=14 P."N";
315  IF Y=15 P."O";
320  IF Y=16 P."P";
325  RET.
330  F.Z=1TO555:N.Z:RET.
```

```
335    Y=50:N=14:IN."CAN YOU MAKE ANY PAIRS";U
340    IF U=N G.380
345    IN."CARD#";S:IN."AND CARD#";T
350    IF A(S)=0 G.360
352    IF S=T G.360
355    IF A(S)=A(T) G.365
360    P."INVALID MATCH":G.335
365    Y=A(S):A(S)=0:A(T)=0:T=A(301):T+1:A(301)=T
370    P."YOU'VE MATCHED A PAIR OF ";:GOS.245:G.335
380    F.X=101 TO 200:R=A(X):IF R=0 G.400
385    F.Z=101 TO 200:IF X=Z G.395
390    S=A(Z):IF R=S GOS.430
395    N.Z
400    N.X:IF Q > 275 G.465
405    W=0:F.X=101 TO 200:W=W+A(X):N.X:T=0
410    IF W=0 G.460
415    W=0:F.X=1 TO 100:W=W+A(X):N.X
420    IF W=0 G.440
425    G.85
430    Y=R:P."I'VE MATCHED A PAIR OF ";:GOS.245
435    R=-5:A(X)=0:A(Z)=0:T=A(302):T=T+1
437    A(302)=T:P.:RET.
440    P."YOU ARE OUT OF CARDS"
445    X=A(301):Y=A(302):P;"YOU MATCHED ";X;" PAIRS"
450    P."AND I MATCHED ";Y;" PAIRS"
455    END
460    P."I AM OUT OF CARDS":G.445
465    P."THE DECK IS OUT OF CARDS":G.445
470    A(T)=0:F.X=1 TO 100:IF A(X)=0 G.485
480    N.X:P.:P.:GOS.330:G.165
485    A(X)=S:S=0:G.480
490    A(T)=0:F.X=1 TO 100:IF A(X)=0 G.510
500    N.X:GOS.330:G.55
510    A(X)=S:S=0:G.500
530    Q=Q+1:Y=A(Q)
535    IF Y=0 G.530
540    RET.
```

Sample Run

```
        GO FISH
YOUR HAND --- 1.)0   2.)M   3.)J   4.)C   5.)K
6.)G   7.)A
MY HAND--- 1.)X   2.)X   3.)X   4.)X   5.)X
6.)X   7.)X
CAN YOU MAKE ANY PAIRS? NO
I'VE MATCHED A PAIR OF C
```

I'VE MATCHED A PAIR OF H
WHAT DO YOU NEED? O
GO FISH!
YOU JUST DREW A D
I NEED A K

YOUR HAND ---1.)O   2.)M   3.)J   4.)C   6.)G   7.)A   8.)D
MY HAND --- 1.)X   2.)X   3.)X   4.)X   6.)X
CAN YOU MAKE ANY PAIRS? NO
I'VE MATCHED A PAIR OF K
WHAT DO YOU NEED? M
I NEED A B
I MUST GO FISH

YOUR HAND --- 1.)O 2.)M 3.)J 4.)C 5.)M

6.)G 7.)A 8.)D

MY HAND --- 1.)X 4.)X

CAN YOU MAKE ANY PAIRS? YES
CARD#? 2
ANY CARD #? 5
YOU'VE MATCHED A PAIR OF M
WHAT DO YOU NEED? J
I NEED A B
I MUST GO FISH

YOUR HAND --- 1.)O   2.)J   3.)J   4.)C   6.)G
7.)A   8.)D
MY HAND --- 1.)X 4.)X

Summary of Variables Used

A-P	CARD VALUES
Q	LOCATION IN DECK
R	PAIR MATCHING
S	PLAYER'S REQUEST/PAIR MATCHING
T	OPPONENT'S HAND SEARCH/PAIR MATCHING
U	MATCH ANY PAIRS?
V	NOT USED
W	CARD COUNT
X-Z	VARIOUS

Quiz Whiz

Quiz Whiz is a simple game in concept. The computer gives you a number (X) and four larger numbers. You have to determine which one is the square of X (X times X). There are ten rounds to a game.

In the easy game X can be any whole number from 1 to 50. The medium game allows half numbers (such as 37.5), and the hard game allows any digit behind the decimal point (39.7, 42.3, 16.8, etc. . .). Of course you can change the over-all complexity of the game by altering the value of X in line 30. As written X = 50 times L. If you substituted "X=40*L", the maximum number is 40 (the L factor is divided back out in a later step; it is used to provide the fractional quantities in the medium and hard games. In the easy game. L = 1).

If you can get a score of 10 without using a calculator or slide rule, you're really a whiz kid. See Fig. 1-13 for the flowchart.

Standard BASIC

```
10   PRINT" ","WHIZ QUIZ"
12   PRINT
14   LET E=1
16   LET M=2
18   LET H=10
20   LET S=0
22   PRINT"EASY, MEDIUM, OR HARD GAME";
24   INPUT L
26   REM* THE GAME *
28   FOR T=1 TO 10
30   LET X=50*L
32   LET Y=INT(RND(0)*X)+1
34   LET X=Y/L
36   LET Y=X*X
38   REM* X IS THE ROOT AND Y IS THE CORRECT ANSWER*
40   FOR M=1 TO 333
42   NEXT M
44   PRINT"WHAT IS ";X;" SQUARED?"
46   LET A=0
48   LET B=0
50   LET C=0
52   LET D=0
54   REM*PLANT CORRECT ANSWER *
57   LET E=INT(RND(0)*4)+1
60   IF E=1 THEN LET A=Y
```
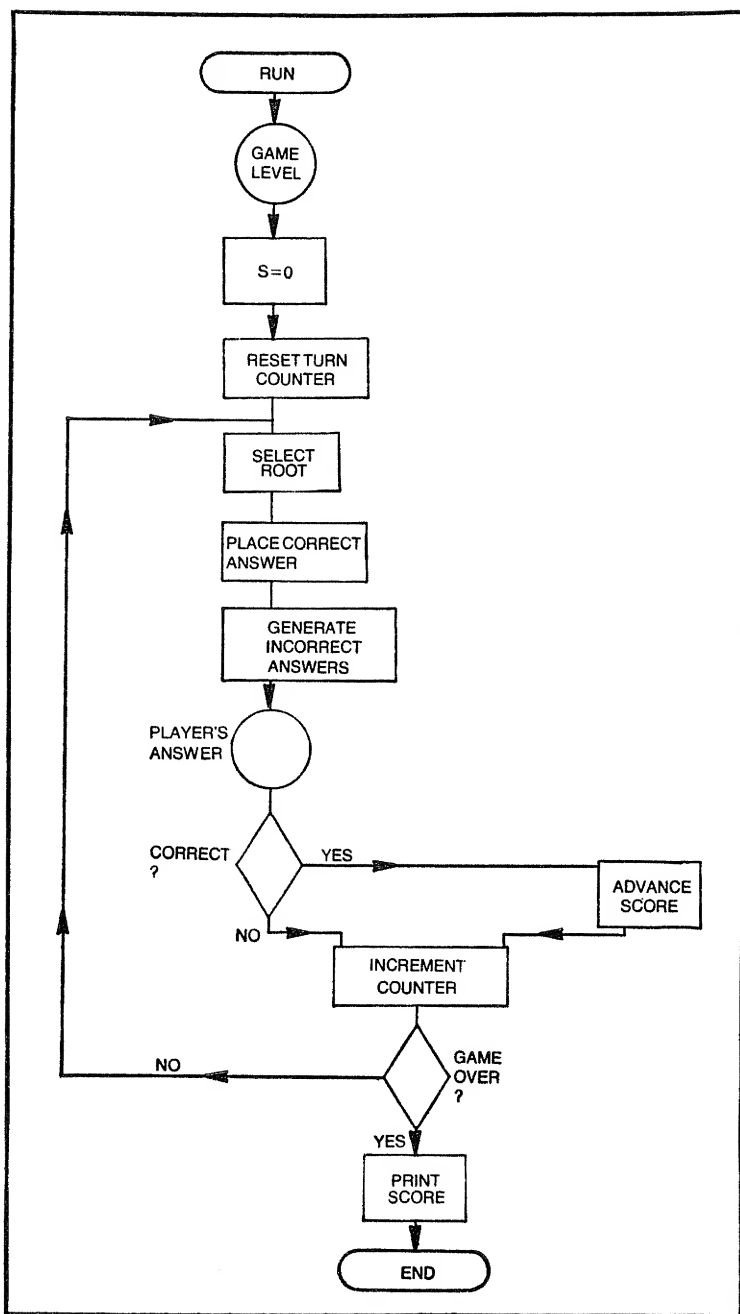
Fig. 1-13. Flowchart for Whiz Quiz.

123

```
 65   IF E=2 THEN LET B=Y
 70   IF E=3 THEN LET C=Y
 75   IF E=4 THEN LET D=Y
 80   REM * WRONG ANSWERS *
 82   IF A>0 THEN GOTO 95
 85   GOSUB 220
 90   LET A=H
 95   IF B>0 THEN GOTO 110
100   GOSUB 220
105   LET B=H
110   IF C>0 THEN GOTO 125
115   GOSUB 220
120   LET C=H
125   IF D>0 THEN GOTO 140
130   GOSUB 220
135   LET D=H
137   REM*PLAYER'S CHOICE *
140   PRINT" A --- ";A
145   PRINT" B --- ";B
150   PRINT" C --- ";C
155   PRINT" D --- ";D
160   INPUT K
162   FOR M= 1 TO 333
165   NEXT M
170   IF K=Y THEN GOTO 200
175   PRINT"WRONG. THE CORRECT ANSWER IS ";Y
180   NEXT T
185   PRINT"THE WHIZ QUIZ IS OVER"
190   PRINT"YOU GOT ";S;" RIGHT"
195   END
200   REM* CORRECT ANSWER*
205   PRINT"RIGHT!"
210   LET S=S+1
215   GOTO 180
220   REM* WRONG ANSWER SELECTION *
225   LET F= INT(RND(0)*0.4*X)+1
230   LET G=INT(RND(0)*F)+1 + X + (F/2)
235   IF G=X THEN GOTO 230
240   LET H =G*G
245   IF L=1 THEN GOTO 260
250   LET G=INT(RND(0)*10)+1
255   LET H=H+(G/L)
260   RETURN
```

TRS-80 BASIC

```
 10   P." ","WHIZ QUIZ":P.
 15   E=1:M=2:H=10:S=0
```

```
20    IN."EASY, MEDIUM, OR HARD GAME";L
25    F.T=1TO10
30    X=50*L:Y=RND(X)
35    X=Y/L:Y=X*X
40    F.M=1TO333:N.M
45    P."WHAT IS";X;" SQUARED?"
50    A=0:B=0:C=0:D=0
55    E=RND(4)
60    IF E=1 THEN A=Y
65    IF E=2 THEN B=Y
70    IF E=3 THEN C=Y
75    IF E=4 THEN D=Y
80    IF A>0 G.95
85    GOS.220
90    A=H
95    IF B>0 G. 110
100   GOS.220
105   B=H
110   IF C>0 G. 125
115   GOS.220
120   C=H
125   IF D>0 G. 140
130   GOS.220
135   D=H
140   P." A ---";A
145   P." B ---";B
150   P." C --";C
155   P." D ---";D
160   IN.K
165   F.M=1TO33:N.M
170   IF K=Y G.200
175   P."WRONG. THE CORRECT ANSWER IS";Y
180   N.T
185   PL"THE WHIZ QUIZ IS OVER."
190   P."YOU GOT ";S;" RIGHT"
195   END
200   P."RIGHT!"
205   S=S+1
210   G.180
220   F=INT(.4*X)
225   G=RND(F)+(X-F/2)
230   IF G=X G. 225
235   H=G*G
240   IF L=1 G. 250
245   H=H+(RND(10)/L)
250   RET.
```

Variables Used

A POSSIBLE ANSWER
B POSSIBLE ANSWER
C POSSIBLE ANSWER
D POSSIBLE ANSWER
E EASY GAME/CORRECT ANSWER SELECTION
F FALSE ANSWER CALCULATIONS
G FALSE ANSWER CALCULATIONS
H FALSE ANSWER CALCULATIONS/HARD GAME
K PLAYER'S ANSWER
L GAME LEVEL
M MEDIUM GAME/TIMING
S SCORE
T TURN COUNTER
X ROOT SELECTION
Y CORRECT ANSWER

Sample Run (Excerpt)

```
     QUIZ WHIZ
WHAT IS 17 SQUARED?
 A --- 256
 B --- 289
 C --- 324
 D --- 196
?A
WRONG. THE CORRECT ANSWER IS 289
WHAT IS 32 SQUARED?
 A --- 941
 B --- 900
 C --- 1225
 D --- 1024
?D
RIGHT!
WHAT IS 50 SQUARED?
 A --- 3249
 B --- 2304
 C --- 2500
 D --- 2025
?C
RIGHT!
```

Tic Tac Toe

Here is a computerized version of that old favorite. The object, of course, is to get three in a row: across, down or diagonally.

It's not easy to beat the computer, but anything's possible. See Fig. 1-14 for the flowchart.

Standard BASIC

```
10   PRINT" LET'S PLAY TIC-TAC-TOE"
12   FOR X=1 TO 9
14   LET A(X)=0
16   NEXT X
18   REM ** THE BOARD IS NOW CLEARED **
20   GOSUB 280
25   PRINT"YOU TAKE THE 'O' AND I'LL TAKE THE 'X'"
27   PRINT:PRINT
30   LET N=INT (RND(0)*2)+1
32   LET M=3
35   GOTO 300
40   IF N=2 THEN GOTO 290
45   PRINT"I'LL GO FIRST THIS TIME"
50   GOSUB 280
55   PRINT"I'LL TAKE SPACE # ";
60   GOSUB 280
65   LET S=INT (RND(0)*9)+1
67   LET A(S)=-1: LET M=1
70   PRINT S
75   GOSUB 280
80   GOTO 300
85   PRINT "WHICH SPACE WILL YOU PLAY";
87   INPUT S
90   LET S=INT(S)
92   LET S=ABS(S): LET M=2
95   IF S>9 THEN GOTO 85
100  100 IF S<1 THEN GOTO 85
105  IF A(S)<0 THEN GOTO 85
110  LET A(S)=-2
115  GOTO 300
120  PRINT "I'LL PAY SPACE # ";
125  LET S=0 : LET M=1
127  REM ** BOARD CHECK FOR COMPUTER'S PLAY **
130  IF A(1)=0 THEN GOTO 147
132  IF A(1)=A(2) THEN LET S=3
```

```
135   IF A(1)=A(3) THEN LET S=2
137   IF A(1)=A(5) THEN LET S=9
140   IF A(1)=A(9) THEN LET S=5
142   IF (1)=A(4) THEN LET S=7
145   IF A(1)=A(7) THEN LET S=4
147   IF A(2)=0 THEN GOTO 157
150   IF A(2)=A(3) THEN LET S=1
152   IF A(2)=A(5) THEN LET S=8
155   IF A(2)=A(8) THEN LET S=5
157   IF A(3)=0 THEN GOTO 170
160   IF A(3)=A(5) THEN LET S=7
162   IF A(3)=A(7) THEN LET S=5
165   IF A(3)=A(6) THEN LET S=9
167   IF A(3)=A(9) THEN LET S=6
170   IF A(4)=0 THEN GOTO 180
172   IF A(4)=A(7) THEN LET S=1
175   IF A(4)=A(5) THEN LET S=6
177   IF A(4)=A(6) THEN LET S=5
180   IF A(5)=0 THEN GOTO 192
182   IF A(5)=A(6) THEN LET S=4
185   LET A(5)=A(9) THEN LET S=1
187   IF A(5)=A(8) THEN LET S=2
190   IF A(5)=A(7) THEN LET S=3
192   IF A(6)=0 THEN GOTO 197
195   IF A(6)=A(9) THEN LET S=3
197   IF A(7)=0 THEN GOTO 210
200   IF A(7)=A(8) THEN LET S=9
205   IF A(7)=A(9) THEN LET S=8
210   IF A(8)=0 THEN GOTO 220
215   IF A(8)=A(9) THEN LET S=7
220   IF S>0 THEN GOTO 230
225   LET S=INT (RND(0)*9)+1
230   IF A(S)<0 THEN GOTO 225
235   GOSUB 280
240   PRINT S
245   LET A(S)=-1
250   GOTO 75
280   REM ** PAUSE **
282   FOR X=1 TO 333
285   NEXT X
287   RETURN
290   PRINT "YOU GO FIRST"
295   GOTO 85
300   REM ** DRAW GRID **
302   PRINT:PRINT:PRINT
305   LET Z=1
```

```
307   FOX X=1 TO 3
310   PRINT " ",
312   FOR Y = 1 TO 3
315   LET V=A(Z)
320   IF V<0 THEN GOTO 475
325   PRINT Z;" ";
330   LET Z=Z+1
```
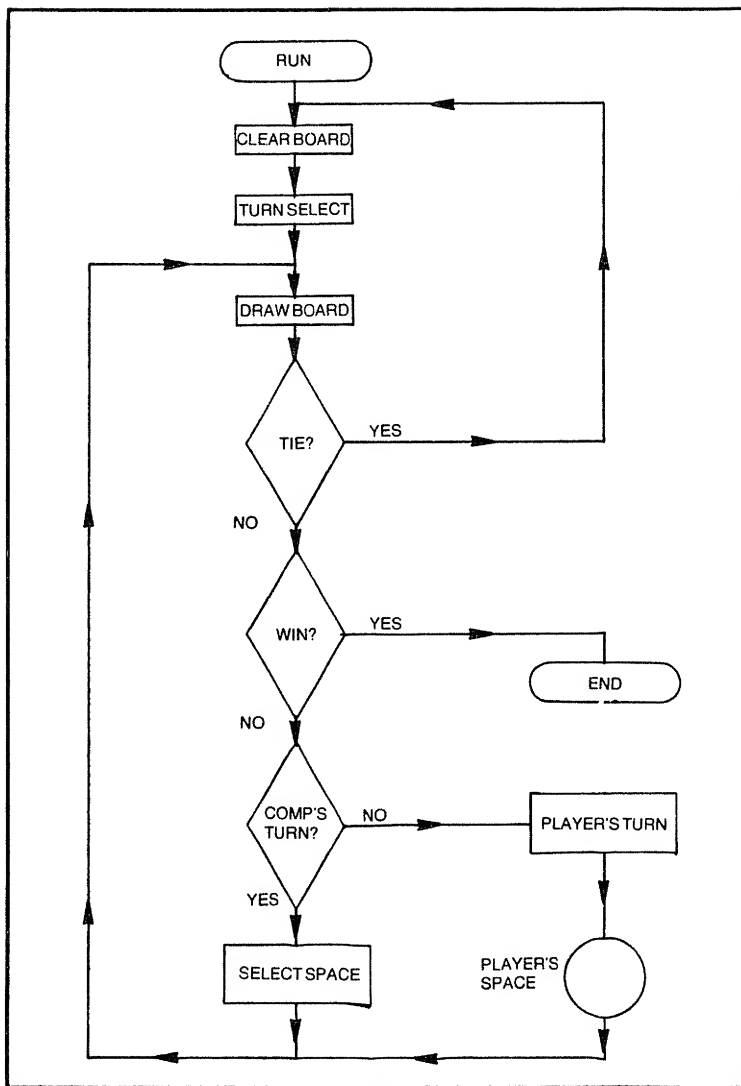

Fig. 1-14. Flowchart for Tic Tac Toe.

129

```
332   NEXT Y
335   PRINT
337   NEXT X
340   PRINT:PRINT
345   REM* WIN CHECK **
347   LET Y=0
350   FOR Z=1 TO 9
355   LET X=Z
360   IF A(X)<0 THEN X=0
365   LET Y=Y+X
370   NEXT Z
375   IF Y=0 THEN GOTO 490
380   IF A(1)=0 THEN GOTO 405
385   LET X=A(1)
390   IF X=A(2) THEN GOSUB 500
395   IF X=A(4) THEN GOSUB 510
400   IF X=A(5) THEN GOSUB 520
405   IF A(2)=0 THEN GOTO 420
410   LET X=A(2)
415   IF X=A(5) THEN GOSUB 530
420   IF A(3)=0 THEN GOTO 440
425   LET X=A(3)
430   IF X=A(6) THEN GOSUB 520
435   IF X=A(5) THEN GOSUB 510
440   IF A(4)=0 THEN GOTO 455
445   LET X=A(4)
450   IF X=A(5) THEN GOSUB 540
455   IF A(7)=0 THEN GOTO 470
460   LET X=A(7)
465   IF X=A(8) THEN GOSUB 520
470   IF M=1 THEN GOTO 85
471   IF M=2 THEN GOTO 120
472   IF M=3 THEN GOTO 40
475   IF V=-1 THEN PRINT "X";
480   IF V=-2 THEN PRINT"0 ";
485   GOTO 330
490   PRINT"TIE GAME — LET'S TRY AGAIN"
495   GOTO 12
500   IF X=A(3) THEN GOTO 550
505   RETURN
510   IF X=A(7) THEN GOTO 550
515   RETURN
520   IF X=A(9) THEN GOTO 550
525   RETURN
530   IF X=A(8) THEN GOTO 550
535   RETURN
```

```
540  IF X=A(6) THEN GOTO 550
545  RETURN
550  IF X=-1 THEN PRINT "I ";
555  IF X=-2 THEN PRINT "YOU";
560  PRINT "WIN!"
565  END
```

TRS-80 BASIC

```
 10  P."LET'S PLAY TIC-TAC-TOE"
 15  F.X=1 TO 9:A(X)=0:N.X.
 20  GOS.280
 25  P."YOU TAKE THE '0' AND I'LL TAKE THE 'X' ":P.:P.
 30  N=RND(2):M=3
 35  G.300
 40  IF N=2 G. 290
 45  P."I'LL GO FIRST THIS TIME"
 50  GOS.280
 55  P."I'LL TAKE SPACE #";
 60  GOS.280
 65  S=RND(9):A(S)=-1
 70  P.S.:M=1
 75  GOS. 280
 80  G.300
 85  IN. "WHICH SPACE WILL YOU PLAY";S
 90  S=INT(S):S=ABS(S):M=2
 95  IF S>9 G.85
100  IF S<1 G. 85
105  IF A(S)<0 G.85
110  A(S)=-2
115  G .300
120  P."I'LL PLAY SPACE #";
125  S=0:M=1
130  IF A(1)=0 G. 147
132  IF A(1)=A(2) THEN S=3
135  IF A(1)=A(3) THEN S=2
137  IF A(1)=A(5) THEN S=9
140  IF A(1)=A(9) THEN S=5
142  IF A(1)=A(4) THEN S=7
145  IF A(1)=A(7) THEN S=4
147  IF A(2)=0 G. 157
150  IF A(2)=A(3) THEN S=1
152  IF A(2)=A(5) THEN S=8
155  IF A(2)=A(8) THEN S=5
157  IF A(3)=0 G. 170
160  IF A(3)=A(5) THEN S=7
```

```
162  IF A(3)=A(7) THEN S=5
165  IF A(3)=A(6) THEN S=9
167  IF A(3)=A(9) THEN S=6
170  IF A(4)=0 G. 180
172  IF A(4)=A(7) THEN S=1
175  IF A(4)=A(5) THEN S=6
177  IF A(4)=A(6) THEN S=5
180  IF A(5)=0 G. 192
182  IF A(5)=A(6) THEN S=4
185  IF A(5)=A(9) THEN S=1
187  IF A(5)=A(8) THEN S=2
190  IF A(5)=A(7) THEN S=3
192  IF A(6)=0 G. 197
195  IF A(6)=A(9) THEN S=3
197  IF A(7)=0 G. 210
200  IF A(7)=A(8) THEN S=9
205  IF A(7)=A(9) THEN S=8
210  IF A(8)=0 G. 220
215  IF A(8)=A(9) THEN S=7
220  IF S>0 G. 230
225  S=RND (9)
230  IF A(S)<0 G.225
235  GOS. 280
240  P.S.
245  A(S)=-1
250  G.75
280  F.X.=1TO333:N.X.
285  RET.
290  P."YOU GO FIRST"
295  G. 85
300  P.:P.:P.:Z=1
305  F.X=1TO3:P." ",
310  F.Y=1TO3
315  V=A(Z)
320  IF V<0 G. 475
325  P.Z;" ";
330  Z=Z+1:N.Y
335  P.:N.X
340  P.:P.
345  Y=0
350  F.Z=1TO9
355  X=Z
360  IF A(X)<0 THEN X=0
365  Y=Y+X
370  N.Z
375  IF Y=0 G. 490
```

```
380   IF A(1)=0   G. 405
385   X=A(1)
390   IF X=A(2) GOS. 500
395   IF X=A(4) GOS. 510
400   IF X=A(5) GOS. 520
405   IF A(2) =0 G. 420
410   X=A(2)
415   IF X=A(5) GOS. 530
420   IF A(3)=0 G. 440
425   X=A(3)
430   IF X=A(6) GOS. 520
435   IF X=A(5) GOS. 510
440   IF A(4)=0 G. 455
445   X=A(4)
450   IF X=A(5) GOS. 540
455   IF A(7)=0 G. 470
460   X=A(7)
465   IF X=A(8) GOS. 520
470   IF M=1 G. 85
471   IF M=2 G. 120
472   IF M=3 G. 40
475   IF V=-1 P."X";
480   IF V=-2 P."O";
485   G. 330
490   P."TIE GAME -- LET'S TRY AGAIN"
495   G. 15
500   IF X=A(3) G. 550
505   RET.
510   IF X=A(7) G. 550
515   RET.
520   IF X=A(9) G. 550
525   RET.
530   IF X=A(8) G. 550
535   RET.
540   IF X=A(6) G. 550
545   RET.
550   IF X=-1 P."I";
555   IF X=-2 P."YOU";
560   P."WIN!";
565   END
```

Summary Of Variables Used

N   TURN SELECT
S   SPACE PLAYED
V   SPACE VALUES
X   TIMING/VARIOUS

Y   TIE CHECK / BOARD DRAWING
Z   SPACE NUMBER

Sample Run

LET'S PLAY TIC-TAC-TOE
YOU TAKE THE 'O' AND I'LL TAKE THE 'X'
```
            1   2   3
            4   5   6
            7   8   9
```
YOU GO FIRST
WHICH SPACE WILL YOU PLAY? 5
```
            1   2   3
            4   0   6
            7   8   9
```
I'LL PLAY SPACE #3
```
            1   2   X
            4   0   6
            7   8   9
```
WHICH SPACE WILL YOU PLAY? 7
```
            1   2   X
            4   0   6
            0   8   9
```
I'LL PLAY SPACE #6
```
            1   2   X
            4   0   X
            0   8   9
```
WHAT SPACE WILL YOU PLAY? 9
```
            1   2   X
            4   0   X
            0   8   0
```
I'LL PLAY SPACE #8
```
            1   2   X
            4   0   X
            0   X   0
```
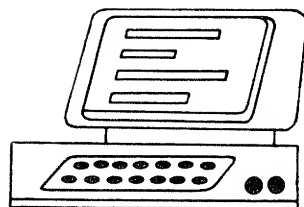WHAT SPACE WILL YOU PLAY? 1
```
            0   2   X
            4   0   X
            0   X   0
```
YOU WIN!!

Chapter 2
Two-Player Games

With the three games in this chapter you can enjoy your computer with a friend. You play against each other and the computer keeps tabs on everything.

To And Fro and Passing Points are designed on a modified board game concept and Money Mad is a light-hearted approach to the stock market.

To And Fro

This is a fairly simple two-player game. The players move along an imaginary board of 100 spaces (the computer does not draw the board, but it continually prints out what spaces the players are on). On each move a player can move from 1 to 6 spaces: the object is to reach the 100th space. But here's the catch; each time you move to a space, the computer tells you its value from −6 to +6. If the value is zero, nothing happens. If the value is positive you are moved ahead that many spaces, and if it is negative you're moved back. The value of the second space you land on is ignored.

The space values are identical for both players, and remain constant throughout the game. See Fig. 2-1 for the flowchart.

Standard BASIC

```
 5   FOR X=1TO25:PRINT:NEXT X
10   PRINT" "," TO AND FRO":PRINT
12   PRINT"PLAYER #1";
15   INPUT A$
17   PRINT"PLAYER #2";
20   INPUT B$
22   PRINT
25   PRINT"THE OBJECT IS TO MOVE FROM POSITION 1 TO"
30   PRINT"POSITION 100. IF YOU GO PAST 100 YOU WILL"
35   PRINT"LOOP BACK TO THE START. EACH MOVE MAY BE"
40   PRINT"FROM 1 TO 6 SPACES. SOME SPACES WILL SEND"
45   PRINT"YOU FORWARD, OTHERS BACKWARD. THE SPACE"
47   PRINT"VALUE IS THE SAME FOR BOTH PLAYERS. THE"
50   PRINT"FIRST TO LAND ON POSITION 100 WINS."
52   FOR X=1 TO 100
54   LET Y=INT(RND(0)*13)−6
56   LET A(X)=Y
58   NEXT X
60   FOR X=1 TO 20
62   LET Y=INT(RND(0)*100)
64   LET A(Y)=0:NEXT X
66   LET A(1)=0
68   LET A(100)=0
70   LET A=1:LET B=1
75   LET T=INT(RND(0)*2)+1
77   IF T=2 THEN GOTO 120
80   GOSUB 150
85   GOSUB 170
90   LET A=A+M
```

```
 95  LET C=A
100  GOSUB 150
105  GOSUB 200
110  LET A=A+M
115  GOSUB 150
120  GOSUB 160
125  GOSUB 170
127  LET B=B+M
130  LET C=B
135  GOSUB 160
140  GOSUB 200
```
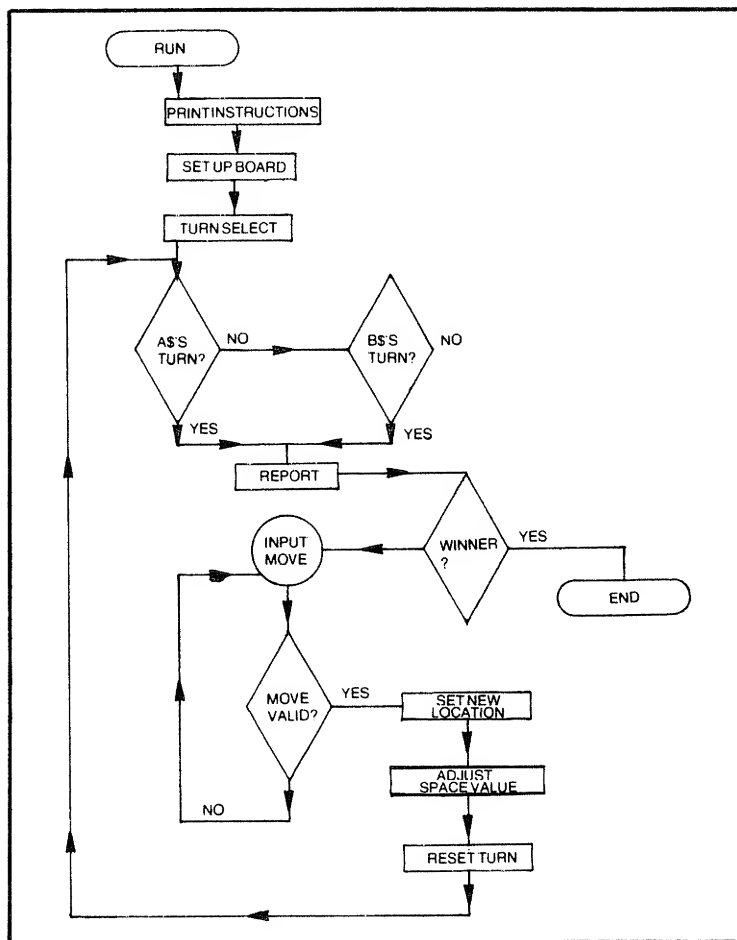

Fig. 2-1. Flowchart for To and Fro.

```
142   LET B=B+M
145   GOSUB 160
147   GOTO 85
150   PRINT A$;" IS AT SPACE #";A
155   GOTO 255
160   PRINT B$;" IS AT SPACE #";B
165   GOTO 255
170   PRINT"YOUR MOVE";
172   INPUT M
175   LET M=INT(M)
177   IF M< THEN GOTO 170
180   IF M>6 THEN GOTO 170
185   RETURN
200   FOR X=1 TO 470:NEXT X
205   LET M=A(C)
210   IF M=0 THEN GOTO 235
215   IF M<0 THEN GOTO 240
220   PRINT"MOVE AHEAD ";M;" SPACES"
225   FOR X=1TO470:NEXT X
227   PRINT
230   RETURN
235   PRINT"BLANK SPACE"
237   GOTO 225
240   LET N=-M
245   PRINT"MOVE BACK ";N;" SPACES"
250   GOTO 225
255   IF A>100 THEN LET A=A-100
260   IF A=100 THEN GOTO 285
265   IF A<1THEN LET A=1
267   IF B>100 THEN LET B=B-100
270   IF B=100 THEN GOTO 290
275   IF B<1 THEN LET B=1
280   RETURN
285   PRINT A$;
287   GOTO 295
290   PRINT B$;
295   PRINT" WINS!"
300   END
```

TRS-80 BASIC

```
10   CLS:P.:P." ","TO AND FRO":P.
15   IN."PLAYER #1";A$
20   IN."PLAYER #2";B$
25   P.:P."THE OBJECT IS TO MOVE FROM POSITION 1 TO
POSITION 100"
```

```
30    P. "IF YOU GO PAST 100 YOU WILL LOOP BACK TO THE
      START."
35    P. "EACH MOVE MAY BE FROM 1 TO 6 SPACES"
40    P. "SOME SPACES WILL SEND YOU FORWARD, OTHERS"
45    P. "BACKWARD. THE SPACE VALUE IS THE SAME FOR
      BOTH"
50    P. "PLAYERS. THE FIRST TO LAND ON POSITION 100 WINS."
55    F.X=1TO100:Y=RND(13)-7:A(X)=Y:N.X:A(1)=0
60    F.X=1TO20:Y=RND(100):A(Y)=0:N.X:A(100)=0
65    A=1:B=1
70    T=RND(2)
75    IF T=2 G.120
80    GOS.150
85    GOS.170
90    A=A+M
95    C=A
100   GOS.150
105   GOS.200
110   A=A+M
115   GOS.150
120   GOS.160
125   GOS.170
130   B=B+M:C=B:GOS.160
135   GOS.200
140   B=B+M:GOS.160:G.85
150   P.A$;" IS AT SPACE #";A
155   G.255
160   P.B$;" IS AT SPACE #";B
165   G.255
170   IN. "YOUR MOVE";M
175   M=INT(M):IF M<1 G.170
180   IF M>6 G.170
185   RET.
200   F.X=1TO470:N.X
205   M=A(C)
210   IF M=0 G.235
215   IF M<0 G.240
220   P. "MOVE AHEAD ";M;" SPACES"
225   F.X=1TO470:N.X:P.
230   RET.
235   P. "BLANK SPACE":G.225
240   N=-M
245   P. "MOVE BACK ";N;" SPACES"
250   G.225
255   IF A>100 THEN A=A-100
260   IF A=100 G.280
```

```
262   If A<1 THEN A=1
265   IF B>100 THEN B=B-100
267   IF B=100 G-285
270   IF B<1 THEN B=1
275   RET.
280   P.A$;: G.290
285   P.B$;
290   P."WINS!"
295   END
```

Summary Of Variables Used

A$ PLAYER #1
B$ PLAYER #2
A   PLAYER #1'S SPACE
B   PLAYER #2'S SPACE
C   INTERMEDIATE SPACE
M   MOVE
N   BACKWARD MOVE
T   TURN COUNTER
X   TIMING
Y   VALUE SETTING

Sample Run (Excerpt)

JOE IS AT SPACE #6
YOUR MOVE? 5
JOE IS AT SPACE #11
BLANK SPACE
JOE IS AT SPACE #11
BILL IS AT SPACE #8
YOUR MOVE? 4
BILL IS AT SPACE #12
MOVE AHEAD 6 SPACES
BILL IS AT SPACE #18
JOE IS AT SPACE #11
YOUR MOVE? 6
JOE IS AT SPACE #17
MOVE BACK 2 SPACES
JOE IS AT SPACE #15
BILL IS AT SPACE #18
YOUR MOVE? 4
BILL IS AT SPACE #22
MOVE AHEAD 2 SPACES
BILL IS AT SPACE #24
JOE IS AT SPACE #15 ·

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Passing Points

In this game the players are on a circular "board" of 25 spaces. Each move can be from 1 to 5 spaces. After passing space #25, the players loop back around to space #1 again. Each space has a point value from −10 to +10. Before the computer reveals the point value of the space, you have the option of either keeping the points yourself or passing them over to your opponent. Obviously, the way to win this game is to remember as many space values from previous laps that you can (taking notes is cheating). Whoever reaches 100 points first, wins. Conversely, if a player reaches −100 points, he or she loses.

The strategy in this game is in deciding whether to go for negative points to hurt your opponent, or positive points to help yourself. See Fig. 2-2 for the flowchart.

Standard BASIC

```
  5  PRINT:PRINT
  7  DIM A(25)
 10  PRINT" ","PASSING POINTS"
 15  PRINT"ENTER 1 FOR INSTRUCTIONS OR 0 TO PLAY"
 17  INPUT X
 20  IF X>0 THEN GOTO 350
 25  REM* SET SPACE VALUES *
 30  FOR X=1 TO 25
 35  LET Y=INT(RND(0)*21)−10
 40  LET A(X)=Y
 45  NEXT X
 50  LET A=1:LET B=1
 55  LET C=0:LET D=0
 60  PRINT"PLAYER #1";
 62  INPUT A$
 65  PRINT"PLAYER #2";
 67  INPUT B$
 70  REM* PLAYER #1'S TURN*
 75  GOSUB 200
 80  PRINT A$;
 85  GOSUB 250
 90  LET A=A+M
 95  IF A>25 THEN LET A=A−25
100  PRINT"SPACE #";A
105  LET J=A(A)
110  GOSUB 300
115  IF G=1 THEN LET D=D+J
```

```
120   IF G=2 THEN LET C=C+J
125   REM* PLAYER #2'S TURN *
130   GOSUB 200
135   PRINT B$;
140   GOSUB 250
145   LET B=B+M
150   IF B>25 THEN LET B=B-25
155   PRINT"SPACE # ";B
160   LET J=A(B)
165   GOSUB 300
170   IF G=1 THEN LET C=C+J
175   IF G=2 THEN LET D=D+J
180   GOTO 70
200   FOR X=1 TO 30
202   PRINT:NEXT X
205   PRINT"PLAYER",A$,B$
210   PRINT"SPACE",A,B
215   PRINT"SCORE",C,D
217   PRINT
220   IF C<-99 THEN GOTO 405
225   IF D<-99 THEN GOTO 415
230   IF C>99 THEN GOTO 415
235   IF D>99 THEN GOTO 405
240   RETURN
250   PRINT" YOUR MOVE";
255   INPUT M
260   REM* VALIDITY CHECK *
265   LET M=INT(M)
270   IF M<1 THEN GOTO 250
275   IF M>5 THEN GOTO 250
280   FOR X=1 TO 333
285   NEXT X
290   RETURN
300   REM* THE CHOICE *
305   PRINT "ENTER 1 TO PASS THE POINTS."
310   PRINT"ENTER 2 TO KEEP THE POINTS."
315   INPUT G
320   IF G=1 THEN 335
325   IF G=2 THEN GOTO 335
330   GOTO 310
335   FOR X=1 TO 400:NEXT X
340   PRINT"VALUE =";J
345   RETURN
350   PRINT" ","INSTRUCTIONS"
355   PRINT"YOU ARE ON A CIRCULAR PATH OF 25 SPACES"
360   PRINT"EACH SPACE HAS A VALUE FROM -10 TO +10."
```

Fig. 2-2. Flowchart for Passing Points.
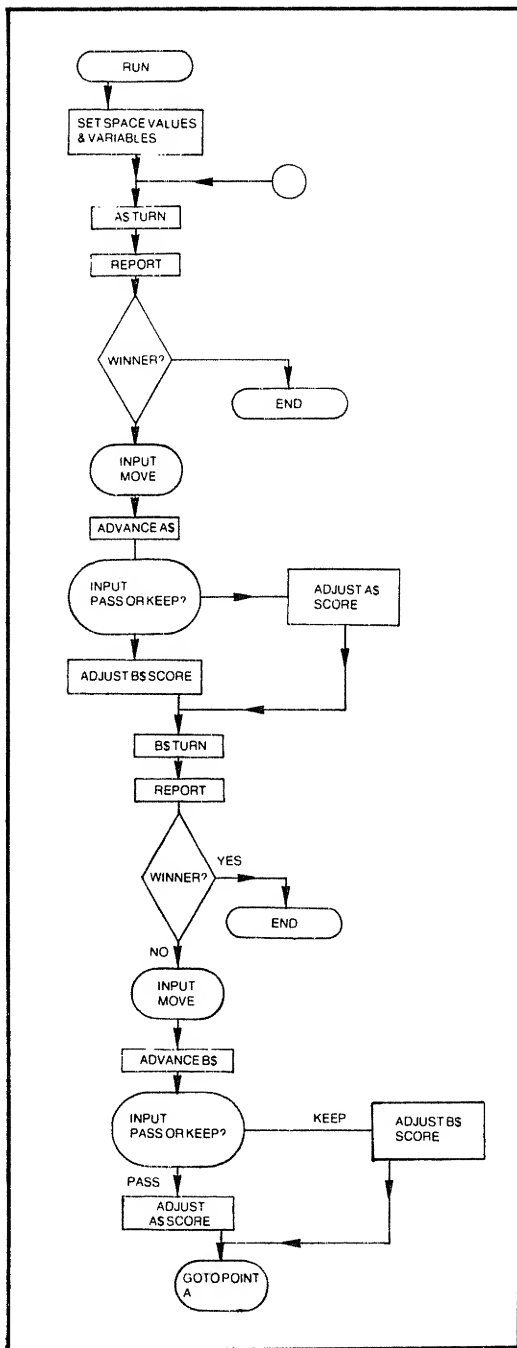
```
365   PRINT"YOU CAN CHOOSE TO KEEP THE POINTS OR PASS"
370   PRINT"THEM TO YOUR OPPONENT. THE GAME IS OVER"
375   PRINT"WHEN EITHER PLAYER REACHES 100 OR – 100."
380   PRINT"THE OBJECT IS TO REMEMBER AS MANY SPACE"
385   PRINT"VALUES AS POSSIBLE SO YOU CAN KNOW WHAT"
390   PRINT"TO CHOOSE. IT'S CHEATING TO KEEP NOTES"
395   PRINT"PRESS 'ENTER' TO PLAY."
400   INPUT A$
402   GOTO 25
405   PRINT B$;
410   GOTO 420
415   PRINT A$;
420   PRINT" WINS!"
425   END
```

TRS-80 BASIC

```
10    P.:P.:P."","PASSING POINTS":P.
15    IN."ENTER 1 FOR INSTRUCTIONS OR 0 TO PLAY";X
20    IF X>0 G. 350
25    F.X=1TO25:Y=RND(21)–11
30    A(X)=Y:N.X
35    A=1:B=1:C=0:D=0
40    IN."PLAYER #1";A$
45    IN."PLAYER #2";B$
70    GOS.200
75    P.A$;
80    GOS.250
85    A=A+M
90    IF A>25 THEN A=A–25
95    P."SPACE # ";A
100   J=A(A)
105   GOS.300
110   IF G=1 THEN D=D+J
115   IF G=2 THEN C=C+J
120   GOS.200
125   P.B$
130   GOS. 250
135   B=B+M
140   IF B>25 THEN B=B–25
145   P."SPACE # ";B
150   J=A(B)
155   GOS.300
160   IF G=1 THEN C=C+J
165   IF G=2 THEN D=D+J
170   G.70
200   CLS:P."PLAYER",A$,B$
```

```
205  P."SPACE",A,B
210  P."SCORE",C,D:P.
215  IF C<-99 G.405
220  IF D<-99 G.415
225  IF C>99 G.415
230  IF D>99 G.405
235  RET.
250  IN." YOUR MOVE";M
255  M=INT(M)
260  IF M<1 G.250
265  IF M>5 G.250
270  F.X=1TO333:N.X.
275  RET.
300  P."ENTER 1 TO PASS THE POINTS."
305  IN. "ENTER 2 TO KEEP THE POINTS."; G
310  IF G=1 G.325
315  IF G=2 G.325
320  G.305
325  F.X=1TO400:N.X
330  P."VALUE =";J
335  RET.
350  P." "," INSTRUCTIONS"
355  P."YOU ARE ON A CIRCULAR PATH OF 25 SPACES."
360  P."EACH SPACE HAS A VALUE FROM -10 TO +10."
365  P."YOU CAN CHOOSE TO KEEP THE POINTS OR PASS"
370  P."THEM TO YOUR OPPONENT. THE GAME IS OVER"
375  P."WHEN EITHER PLAYER REACHES 100 OR -100"
380  P."POINTS. THE OBJECT IS TO REMEMBER AS MANY"
385  P."SPACE VALUES AS POSSIBLE SO YOU CAN KNOW"
390  P."WHAT TO CHOOSE. IT'S CHEATING TO KEEP"
395  P."NOTES. PRESS 'ENTER' TO PLAY."
400  IN.A$:G.25
405  P.B$;
410  G.420
415  P.A$
420  P."WINS!"
425  END
```

Summary of Variables Used

A$ PLAYER #1
B$ PLAYER #2
A   PLAYER #1'S SPACE
B   PLAYER #2'S SPACE
C   PLAYER #1'S SCORE
D   PLAYER #2'S SCORE
G   PASS OPTION

J   SPACE VALUE
K   KEEP (=2)
M   MOVE
P   PASS (=1)
X   TIMING
Y   VALUE SETTING

Sample Run (Excerpt)

PASSING POINTS

ENTER 1 FOR INSTRUCTIONS OR 0 TO PLAY ?0
PLAYER #1? JOE
PLAYER #2? BILL

PLAYER	JOE	BILL
SPACE	1	1
SCORE	0	0

JOE YOUR MOVE? 5
SPACE #6
PASS IT OR KEEP IT? KEEP
VALUE =6

PLAYER	JOE	BILL
SPACE	6	1
SCORE	6	0

BILL YOUR MOVE? 4
SPACE #5
PASS IT OR KEEP IT? KEEP
VALUE =- 10

PLAYER	JOE	BILL
SPACE	6	5
SCORE	6	- 10

JOE YOUR MOVE? 5
SPACE #11
PASS IT OR KEEP IT? PASS
VALUE = 4

PLAYER	JOE	BILL
SPACE	11	5
SCORE	6	-6

Money Mad

The object in *Money Mad* is to make as much money off your "investments" as possible. Each player starts out with $10,000. The first player to double that amount wins. Conversely, the first player to squander down to a net value of $1000, or cash holdings of less than $500, loses.

On each turn you can buy any of six offered stocks. By watching the way their values fluctuate on each report, you can try to determine which stocks are the most valuable. Remember though, the stocks which gain the greatest amounts can also lose the greatest amounts. Sometimes a stock's value may go negative. A player could cheat by buying up a few hundred shares of a negative stock to increase cash holdings. If you want to prevent this you can add the following step:

242 IF Q<0 THEN GOTO 255
The TRS-80 version would read—
242 IF Q<0 G.250

Rather than buying one of the established stocks, the players can choose to invest in an "independent venture". This is a one-shot deal that affects only the player's cash, not his stockholdings. The player can invest as much as he wants (provided, of course, he has the cash to pay for it). He can gain up to 100% of his investment, or he can lose up to 100%. For example, let's assume the player has $10,000, and invests $1000. If his investment gains 100% he'll end up with $11,000—if it loses 100% he'll only have $8000. Usually, of course, it will be somewhere between the extremes, but the loss or gain is entirely random.

All in all, this game is designed to be fairly unpredictable, but not pure chance. Strategy can be used to your advantage. At any rate, the result is a game that's almost as screwy as the "real" world of big finance.

Standard BASIC

```
 5   PRINT:PRINT:PRINT
 7   PRINT" ","MONEY MAD"
10   PRINT
12   LET A(70)=0
14   PRINT"TYCOON #1";
16   INPUT A$
18   PRINT"TYCOON #2";
```

```
20    INPUT B$
22    LET X=10000:LET U=0
24    LET Y=10000:LET V=0
26    FOR Z=1 TO 20
28    LET A(Z)=0:NEXT Z
30    LET A=INT(RND(0)*500)+1
32    LET B=INT(RND(0)*500)+1
34    LET C=INT(RND(0)*500)+1
36    LET D=INT(RND(0)*500)+1
38    LET E=INT(RND(0)*500)+1
40    LET F=INT(RND(0)*500)+1
42    PRINT"YOU EACH START OUT WITH $10,000"
44    PRINT"THE FOLLOWING STOCKS ARE AVAILABLE"
46    GOSUB 370
48    LET G=INT(RND(0)*100)/100
50    LET H=INT(RND(0)*100)/100
52    LET I=INT(RND(0)*100)/100
54    LET J=INT(RND(0)*100)/100
56    LET K=INT(RND(0)*100)/100
58    LET L=INT(RND(0)*100)/100
60    FOR Z=1 to 666:NEXT Z
65    PRINT"NEXT REPORT"
70    GOSUB 300
75    PRINT"TYCOON","CASH, "STOCKHOLDINGS"
80    PRINT A$,X,U
82    PRINT B$,Y,V
85    GOSUB 260
90    PRINT A$;"WHAT WILL YOU INVEST IN?"
92    LET A(23)=1
95    GOSUB 195
100   IF T>X GOTO 410
105   LET R=A(M)
107   LET X=X–T
110   LET R=R+S
112   LET A(M)=R
115   PRINT B$;" WHAT WILL YOU INVEST IN?"
117   LET A(23)=2
120   GOSUB 195
122   IF T>Y THEN GOTO 410
125   LET M=M+10
127   LET R=A(M):LET Y=Y–T
130   LET R=R+S
132   LET A(M)=R
135   GOTO 60
140   PRINT"AMOUNT INVESTED"
142   INPUT T
```

148

```
144  LET S=0
146  LET M=0
148  LET N=INT(RND(0)*200)-99
150  FOR Z=1TO555:NEXT Z
152  IF A(23)=2 THEN GOTO 175
155  IF T>X THEN GOTO 410
160  PRINT"PAYOFF IS ";N;"%"
162  LET X=X-T
164  LET N=N/100:LET T=T+(T*N)
166  LET X=X+T
168  LET T=0
170  RETURN
175  IF T>Y THEN GOTO 410
180  PRINT"PAYOFF IS ";N;"%"
182  LET Y=Y-T
184  LET N=N/100
186  LET T=T+(T*N)
188  LET Y=Y+T
190  LET T=0
192  RETURN
195  PRINT"(ENTER 1-7)    ";
197  INPUT M
200  LET M=INT(M)
202  IF M<1 THEN GOTO 195
205  IF M>7 THEN GOTO 195
210  IF M=1 THEN LET Q=A
215  IF M=2 THEN LET Q=B
220  IF M=3 THEN LET Q=C
225  IF M=4 THEN LET Q=D
230  IF M=5 THEN LET Q=E
235  IF M=6 THEN LET Q=F
237  REM* M=7 IS FOR INDEPENDENT VENTURES*
240  IF M=7 THEN GOTO 140
245  PRINT" # OF SHARES";
247  INPUT S
250  LET T=S*Q
252  PRINT"TOTAL COST = $";T
255  RETURN
260  LET M=X+U:LET N=Y+V
262  IF X<500 THEN GOTO 505
263  IF Y<500 THEN GOTO 505
265  IF M<1000 THEN GOTO 290
270  IF N<1000 THEN GOTO 420
275  IF M>20000THEN GOTO 445
280  IF N>20000 THEN GOTO 430
285  RETURN
```

```
290   PRINT A$;"IS BANKRUPT"
295   END
300   LET S=1:LET R=INT(RND(0)*5)+1
302   IF R>3 THEN LET S=-1
305   LET A=A+(A*S*(G+R/170))
310   LET S=1:LET R=INT(RND(0)*5)+1
312   IF R>3 THEN LET S=-1
315   LET B=B+(B*S*(H+R/174))
320   LET S=1:LET R=INT(RND(0)*5)+1
322   IF R>3 THEN LET S=-1
325   LET C=C+(C*S*(I+R/170))
330   LET S=1:LET R=INT(RND(0)*5)+1
332   IF R>3 THEN LET S=-1
335   LET D=D+(D*S*(J+R/171))
340   LET S=1:LET R=INT(RND(0)*5)+1
342   IF R>3 THEN LET S=-1
345   LET E=E+(E*S*(K+R/171))
350   LET S=1:LET R=INT(RND(0)*5)+1
352   IF R>3 THEN LET S=-1
355   LET F=F+(F*S*(L+R/171))
360   LET U=(A(1)*A)+(A(2)*B)+(A(3)*C)+(A(4)*D)
362   LET U=U+(A(5)*E)+(A(6)*F)
365   LET V=(A(11)*A)+(A(12)*B)+(A(13)*C)+(A(14)*D)
367   LET V=V+(A(15)*E)+(A(16)*F)
370   PRINT"#1 ALLWEED ACRES","$";A
375   PRINT"#2 BURNT BAKERIES","$";B
380   PRINT"#3 CRUMBLED COMMUNICATIONS","$";C
385   PRINT"#4 DENTED DESKS, INC.","$";D
390   PRINT"#5 ELONGATED ENTERPRISES","$";E
395   PRINT"#6 FIZZLED FINANCE","$";F
400   PRINT"#7 INDEPENDENT VENTURES","?"
405   RETURN
410   PRINT"YOU HAVE OVER-INVESTED! YOU CAN'T AFFORD"
415   PRINT"IT! YOU LOSE"
417   END
420   PRINTB$;"IS BANKRUPT"
425   END
430   PRINT B$;"HAS DOUBLED HIS FORTUNE!"
435   PRINT" A FINANCIAL WIZARD!"
440   END
445   IF N>20000 THEN GOTO 460
450   PRINT A$;"HAS DOUBLED HIS FORTUNE!"
455   GOTO 435
460   PRINT"YOU HAVE BOTH DOUBLED YOUR FORTUNES!"
465   IF N>M THEN GOTO 485
470   IF M>N THEN GOTO 495
```

```
475    PRINT "IN AN EXACT TIE!?!"
480    END
485    PRINT"BUT ";B$;"IS RICHER THAN ";A$
490    END
495    PRINT"BUT ";A$;" IS RICHER THAN ";B$
500    END
505    PRINT"TYCOON","CASH","HOLDINGS","TOTAL ASSETS"
510    PRINT A$,X,U,M
515    PRINT B$,Y,V,N
520    IF M>N THEN PRINT"TIE—NO ONE";
525    IF M>N THEN PRINT A$;
530    IF N>M THEN PRINT B$;
535    PRINT" WINS!"
540    END
```

TRS-80 BASIC

```
10    CLS:P.:P." "","MONEY MAD":P.:X=10000:Y=10000
15    IN."TYCOON #1 ";A$:IN."TYCOON #2 "B$:A(70)=0
20    F.Z=1TO20:A(Z)=0:N.Z:A=RND(500):B=RND(500):
       C=RND(500)
25    D=RND(500):E=RND(500):F=RND(500):G=RND(100)/100
30    P."YOU EACH START OUT WITH $10,000":H=RND(100)/100
35    P."THE FOLLOWING STOCKS ARE AVAILABLE":GOS.370
40    I=RND(100)/100:J=RND(100/100:K=RND(100/100:
       L=RND(100)/100
60    F.Z=1TO666:N.Z:P."NEXT  REPORT":GOS.300
65    P."TYCOON","CASH","STOCKHOLDINGS"
70    P.A$,X,U:P.B$,Y,V:GOS. 260:A(23)=1
75    P.A$;" WHAT WILL YOU INVEST IN?":GOS.195
80    IF T>X G.410
85    R=A(M):X=X−T:R=R+S:A(M)=R:A(23)=2
90    P.B$;" WHAT WILL YOU INVEST IN?":GOS.195
95    IF T>Y G.410
100   M=M+10:R=A(M):Y=Y−T:R=R+S:A(M)=R:G.60
140   IN."AMOUNT INVESTED";T:M>2:N=RND(200)−100:S=Q
145   F.Z=1TO555:N.Z:IFA(23)=2 G.175
150   IF T>X G.410
155   P."PAYOFF IS";N;"%":X=X−T:N=N/100:T=T+(T*N)
160   X=X+T:T=0:RET.
175   IF T>Y G.410
180   P."PAYOFF IS";N;"%":Y=Y−T:N=N/100:T=T+(T*N)
185   Y=Y+T:T=0:RET.
195   IN."(ENTER 1 - 7)   ";M:M=INT(M)
200   IF M<1 GOTO 195
205   IF M>7 GOTO 195
210   IF M=1THENQ=A
215   IFM=2THENQ=B
220   IFM=3THENQ=C
```

```
225    IFM=4THENQ=D
230    IFM=5THENQ=E
235    IFM=6THENQ=F
240    IFM=7G.140
245    IN."# OF SHARES";S:T=S*Q:P."TOTAL COST = $";T
250    RET.
260    M=X+U:N=Y+V:IFX<500G.505
262    IFY>500G.505
265    IFM<1000.G.290
270    IFN<1000G.290
275    IFM>20000G.445
280    IFN>20000G.430
285    RET.
290    P.A$;"IS BANKRUPT":END
300    S=1:R=RND(5);IFR>3THENS=-1
305    A=A+(A*S*(G+R/170)):S=1:R=RND(5): IFR>3THENS=-1
310    B=B+(B*S*(H+R/170)):S=1:R=RND(5):IFR>3THENS=-1
315    C=C+(C*S*(I+R/170)):S=1:R=RND(5):IFR>3THENS=-1
320    D=D+(D*S*(J+R/170)):S=1:R=RND(5):IFR>3THENS=-1
325    E=E+(E*S*(K+R/170)):S=1:R=RND(5):IFR>3THENS=-1
330    F=F+(F*S*(L+R/1.7))
360    U=(A(1)*A)+(A(2)*B)+(A(3)*C)+(A(4)*D)+(A(5)*E)+(A(6)*F)
365    V=(A(11)*A)+(A(12)*B)+(A(13)*C)+(A(14)*D)+(A(15)*E)+
       (A(16)*F)
370    P."#1 ALLWEED ACRES","$";A:P."#2 BURNT BAKE-
       RIES","$";B
375    P."#3 CRUMBLED COMMUNICATIONS","$";C:P."#4 DEN-
       TED DESKS,INC.",
380    P."$";D:P."#5 ELONGATED ENTERPRISES","$";E
385    P."# 6  FIZZLED  FINANCE","$";F:P."#7 INDEPENDENT
       VENTURES","?"
390    RET.
410    P."YOU HAVE OVER-INVESTED! YOU CAN'T AFFORD IT"
415    P."YOU LOSE!":END
420    P.B$;"IS BANKRUPT":END
430    P.B$;"HAS DOUBLED HIS FORTUNE!"
435    P."A FINANCIAL WIZARD!":END
445    IFN>20000G.460
450    P.A$;"HAS DOUBLED HIS FORTUNE!":G.435
460    P."YOU HAVE BOTH DOUBLED YOUR FORTUNES!":IFN>M
       G.485
465    IFM>NG.495
470    P."IN AN EXACT TIE!":END
485    P."BUT ";B$;"IS RICHER THAN ";A$:END
495    P."BUT ";A$;"IS RICHER THAN ";B$:END
505    P."TYCOON","CASH","STOCKHOLDINGS","TOTAL ASSETS"
```

```
510   P. A$, X, U, M: P. B$, Y, V, N: IF M=N P. "TIE — NO ONE";
515   IF M>N P. A$;
520   IF M<N P. B$;
525   P. " WINS!": END
```

Money Mad

A$ TYCOON #1
B$ TYCOON #2
A   ALLWEED ACRES * STOCK VALUE
B   BURNT BAKERIES * STOCK VALUE
C   CRUMBLED COMMUNICATIONS * STOCK VALUE
D   DENTED DESKS, INC * STOCK VALUE
E   ELONGATED ENTERPRISES * STOCK VALUE
F   FIZZLED FINANCE * STOCK VALUE
G   ALLWEED ACRES * GROWTH PERCENTAGE
H   BURNT BAKERIES * GROWTH PERCENTAGE
I   CRUMBLED COMMUNICATIONS * GROWTH PERCENTAGE
J   DENTED DESKS, INC * GROWTH PERCENTAGE
K   ELONGATED ENTERPRISES * GROWTH PERCENTAGE
L   FIZZLED FINANCE * GROWTH PERCENTAGE
M   INVESTMENT CHOICE/TYCOON #1's TOTAL WORTH
N   TYCOON #2's TOTAL WORTH
Q   VARIOUS CALCULATIONS
R   VARIOUS CALCULATIONS
S   VARIOUS CALCULATIONS
T   AMOUNT INVESTED
U   TYCOON #1'S STOCKHOLDINGS
V   TYCOON #2'S STOCKHOLDINGS
X   TYCOON #1'S MONEY
Y   TYCOON #'S MONEY

Sample Run (Excerpt)

                    MONEY MAD
TYCOON #1   ?JOE
TYCOON #2   ?BILL
YOU EACH START OUT WITH $10000
THE FOLLOWING STOCKS ARE AVAILABLE
#1 ALLWEED ACRES $376
#2 BURNT BAKERIES $452
#3 CRUMBLED COMMUNICATIONS $165
#4 DENTED DESKS, INC. $200
#5 ELONGATED ENTERPRISES $419
#6 FIZZLED FINANCE $68
#7 INDEPENDENT VENTURES   ?
NEXT REPORT
#1 ALLWEED ACRES $454.5712

```
#2 BURNT BAKERIES                              $880.3152
#3 CRUMBLED COMMUNICATIONS                     $221.9725
#4 DENTED DESKS, INC.                          $98.94
#5 ELONGATED ENTERPRISES                       $145.4349
#6 FIZZLED FINANCE                             $110.6768
#7 INDEPENDENT VENTURES                        ?
TYCOON      CASH       STOCKHOLDINGS
JOE         10000      0
BILL        10000      0


JOE WHAT WILL YOU INVEST IN?
(ENTER 1-7)   ?1
# OF SHARES? 10
TOTAL COST = $4544.712
BILL WHAT WILL YOU INVEST IN?
(ENTER 1-7)   ? 2
# OF SHARES? 5
TOTAL COST = $4401.576
NEXT REPORT
#2 BURNT BAKERIES                              $279.3634
# BURNT BAKERIES                               $1662.6513
#3 CRUMBLED COMMUNICATIONS                     $390.4039
#4 DENTED DESKS, INC.                          $137.3124
#5 ELONGATED ENTERPRISES                       $59.1164
#6 FIZZLED FINANCE                             $180.3404
#7 INDEPENDENT VENTURES                        ?
TYCOON      CASH            STOCKHOLDINGS
JOE         5455.288        2793.634
BILL        5598.424        8313.2565
JOE WHAT WILL YOU INVEST IN?
(ENTER 1-7)   ? 7
AMOUNT INVESTED? 2000
PAYOFF IS 58%
BILL WHAT WILL YOU INVEST IN?
(ENTER 1-7)   ? 7
AMOUNT INVESTED? 3000
PAYOFF IS – 12%
NEXT REPORT
                          #***#
TYCOON      CASH            STOCKHOLDINGS
JOE         6615.288        2542.814
BILL        5598.424        – 504.59
```

(NOTE — It looks like BILL's in trouble)

Gambling Boxes

In this game, each of the two players starts out with $10. The first player to gather more than $500 wins the game.

On each round the players are offered three mystery boxes labeled X, Y, and Z that can multiply their fortunes (the computer randomly selects one of the players to go first each round). The maximum values for each is explained in the program instructions. Notice that, while X can have the greatest multiplier value, it can also have the greatest tax rate. Box Z can thus conceivably be worth more than box X. This, of course, is the gambling aspect of the game.

On each round any given box may be selected only once. For example, if Player #1 takes box X, Player #2 is limited to choosing box Y or box Z. See Fig. 2-3 for the flowchart.

Standard BASIC

```
 5  PRINT:PRINT:PRINT:PRINT
 7  PRINT" ","GAMBLING BOXES":PRINT
10  LET A=10:LET B=10
12  LET X=17:LET Y=19:LET Z=23
15  PRINT"PLAYER #1";
17  INPUT A$
20  PRINT"PLAYER #2";
22  INPUT B$
25  PRINT"EACH X BOX CAN MULTIPLY YOUR FORTUNE BY"
27  PRINT"UP TO 10, WITH UP TO 75% TAXES. EACH"
30  PRINT"Y BOX CAN MULTIPLY BY UP TO 5 WITH TAXES"
32  PRINT"UP TO 50%. Z CAN MULTIPLY UP TO 2 WITH"
35  PRINT"NO MORE THAN 25% TAXES."
45  LET P=INT(RND(0)*2)+1
47  LET M=INT(RND(0)*100)+1
50  LET N=INT(RND(0)*50)+1
52  LET Q=INT(RND(0)*20)+1
55  LET M=M/10:LET N=N/10:LET Q=Q/10
57  LET R=INT(RND(0)*75)+1
60  LET S=INT(RND(0)*50)+1
62  LET T=INT(RND(0)*25)+1
64  IF P=1 THEN GOTO 100
66  LET C=0:GOSUB 200
68  GOSUB 320
70  IF A>500 THEN GOTO 150
75  IF B>500 THEN GOTO 160
80  PRINT"NEXT ROUND"
```

```
 85   GOTO 45
100   LET D=0
105   GOSUB 320
110   GOSUB 200
115   GOTO 70
150   PRINT A$;" WINS! "
155   END
160   PRINT B$;" WINS! "
165   END
200   PRINT B$;", WHAT BOX WILL YOU TAKE";
205   INPUT D
210   IF D=C THEN GOTO 235
215   IF D=X THEN GOTO 245
220   IF D=Y THEN GOTO 265
225   IF D=Z THEN GOTO 275
230   GOTO 200
235   PRINT A$;" ALREADY TOOK THAT BOX"
240   GOTO 200
245   LET E=B*M:LET F=E+(R/100)
247   LET H=R:LET B=E-F:LET L=B
250   PRINT"VALUE IS $";E
255   PRINT"TAXES = ";H;"%"
257   PRINT"YOU NOW HAVE $";L
260   RETURN
265   LET E=B*N:LET F=E*(S/100)
267   LET B=E-F:LET H=S:LET L=B
270   GOTO 250
275   LET E=B*Q:LET F=E*(T/100)
277   LET B=E-F:LET H=T:LET L=B
280   GOTO 250
285   LET E=A*M:LET F=E*(R/100)
287   LET A=E-F:LET H=R:LET L=A
290   GOTO 250
295   LET E=A*N:LET F=E*(S/100)
297   LET A=E-F:LET H=S:LET L=A
300   GOTO 250
305   LET E=A*Q:LET F=E*(T/100)
307   LET A=E-F:LET H=T:LET L=A
310   GOTO 250
320   PRINT A$;" WHAT BOX WILL YOU TAKE";
325   INPUT C
330   IF C=D THEN GOTO 355
335   IF C=X THEN GOTO 285
340   IF C=Y THEN GOTO 295
345   IF C=Z THEN GOTO 305
350   GOTO 320
```
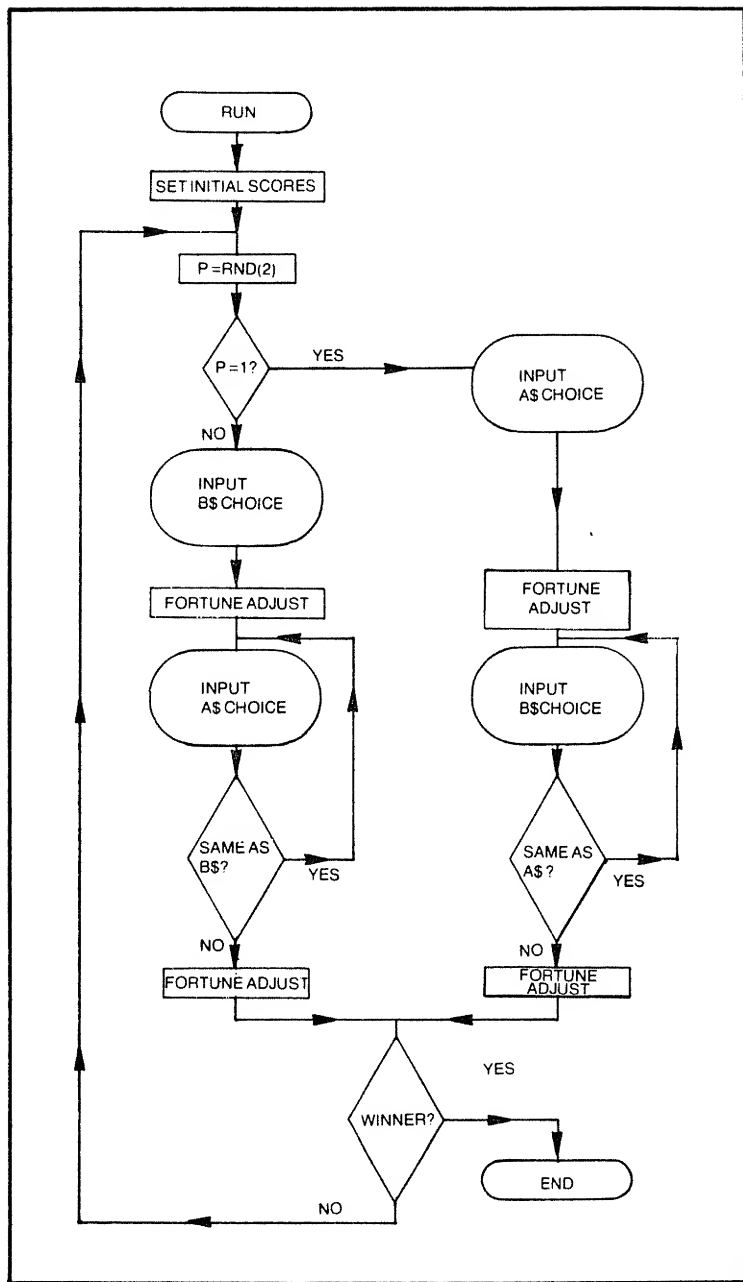
Fig. 2-3. Flowchart for Gambling Boxes.

```
355   PRINT B$;" ALREADY TOOK THAT BOX"
360   GOTO 320
```

TRS-80 BASIC

```
  5   CLS:P.:P." ","GAMBLING BOXES":P.
 10   A=10:B=10:X=17:Y=19:Z=23
 15   IN."PLAYER #1";A$:IN."PLAYER #2";B$
 20   P."EACH X BOX CAN MULTIPLY YOUR FORTUNE BY"
 25   P."UP TO 10, WITH UP TO 75% TAXES. EACH"
 30   P."Y BOX CAN MULTIPLY BY UP TO 5 WITH TAXES"
 35   P."UP TO 50%. Z CAN MULTIPLY UP TO 2 WITH"
 40   P."NO MORE THAN 25% TAXES."
 45   P=RND(2):M=RND(100)/10:N=RND(50)/10
 50   Q=RND(20)/10:R=RND(75):S=RND(50):T=RND(25)
 55   IF P=1 G.100
 60   C=0:GOS.200
 65   GOS.320
 70   IF A>500 G.150
 75   IF B>500 G.160
 80   P."NEXT ROUND":G.45
100   D=0:GOS.320
105   GOS.200
110   G.70
150   P.A$;" WINS!"
155   END
160   P.B$;" WINS!"
165   END
200   P.B$;", WHAT BOX WILL YOU TAKE";
205   IN.D
210   IF D=C G.235
215   IF D=X G.245
220   IF D=Y G.265
225   IF D=Z G.275
230   G.200
235   P.A$;" ALREADY TOOK THAT BOX"
240   G.200
245   E=B*M:F=E+(R/100):H=R:B=E−F:L=B
250   P."VALUE IS $";E
255   P."TAXES = ";H;"%"
257   P."YOU NOW HAVE $";L
260   RET.
265   E=B*N:F=E*(S/100):H=S:B=E−F:L=B
270   G.250
275   E=B*Q:F=E*(T/100):H=T:B=E−F:L=B
280   G.250
285   E=A*M:F=E*(R/100):A=E−F:H=R:L=A
```

```
290    G.250
295    E=A*N:F=E*(S/100):A=E−F:H=S:L=A
300    G.250
305    E=A*Q:F=E*(T/100):A=E−F:H=T:L=A
310    G.250
320    P.A$;", WHAT BOX WILL YOU TAKE";
325    IN.C
330    IF C=D G.355
335    IF C=X G.285
340    IF C=Y G.295
345    IF C=Z G.305
350    G.320
355    P.B$;" ALREADY TOOK THAT BOX"
360    G.320
```

Summary of Variables Used

A$ PLAYER #1
B$ PLAYER #2
A   A$ SCORE
B   B$ SCORE
C   A$ BOX CHOICE
D   B$ BOX CHOICE
E   BOX VALUE
F   TAXES
H   TAX PERCENTAGE
L   CURRENT SCORE
M   BOX 1 MULTIPLIER
N   BOX 2 MULTIPLIER
P   PLAYER SELECT
Q   BOX 3 MULTIPLIER
R   BOX 1 TAX
S   BOX 2 TAX
T   BOX 3 TAX
X   BOX 1
Y   BOX 2
Z   BOX 3

Sample Run (Excerpt)

GAMBLING BOXES

PLAYER #1?HOMER
PLAYER #2?JETHRO
EACH X BOX CAN MULTIPLY YOUR FORTUNE BY
UP TO 10, WITH UP TO 75% TAXES. EACH
Y BOX CAN MULTIPLY BY UP TO 5 WITH TAXES

UP TO 50%. Z CAN MULTIPLY UP TO 2 WITH
NO MORE THAN 25% TAXES.
HOMER, WHAT BOX WILL YOU TAKE?X
VALUE IS $73
TAXES = 38%
YOU NOW HAVE 45.26
JETHRO, WHAT BOX WILL YOU TAKE?X
HOMER ALREADY TOOK THAT BOX
JETHRO, WHAT BOX WILL YOU TAKE?Y
VALUE IS $21
TAXES = 42%
YOU NOW HAVE $12.18
NEXT ROUND
JETHRO, WHAT BOX WILL YOU TAKE?X
VALUE IS $101.094
TAXES = 50%
YOU NOW HAVE $50.547
HOMER, WHAT BOX WILL YOU TAKE?Z
VALUE IS $54.312
TAXES = 11%
YOU NOW HAVE $48.33768
NEXT ROUND
JETHRO, WHAT BOX WILL YOU TAKE?X
VALUE IS $121.3128
TAXES = 65%
YOU NOW HAVE $78.85332
HOMER, WHAT BOX WILL YOU TAKE?Y
VALUE IS $145.01304
TAXES = 7%
YOU NOW HAVE $134.8621272
NEXT ROUND

Stack Cut

In this game, the computer shuffles a deck of cards. The suits are ignored: only the numerical values are counted. Aces count as one, Jacks as 11, Queens as 12, and Kings as 13. There are also two jokers in the deck which each count as −35.

The players take turns cutting the stack of cards. A player may cut from one to ten cards; then the value of the top card is added to that player's score. When the deck runs out of cards, the computer starts over at the beginning of the deck. The cards all retain the same positions throughout the game, and can be played more than once, so the position of certain cards can be memorized. For an even more difficult version of the game eliminate step 330, which displays the card's positional number.

As the program is written, each player cuts the stack 35 times, then the game is ended and the winner is declared. You can vary the number of turns in a game by changing step 205. The more turns there are, the more times the players will go through the deck, turning *Stack Cut* into more of a game of memory and strategy than chance. The first few passes through the deck are inevitably played as pure chance. See Fig. 2-4 for the flowchart.

Standard BASIC

```
10   FOR X=1 TO 54
15   LET A(X)=0
20   PRINT
25   NEXT X
30   PRINT" ","STACK CUT"
35   LET X=INT (RND(0)*54)+1
40   LET A(X)=−35
45   LET X=INT(RND(0)*54)+1
50   IF A(X)<0 THEN GOTO 45
55   LET A(X)=−35
60   PRINT"NAME OF PLAYER #1";
65   INPUT A$
70   GOSUB 450
72   GOSUB 450
74   LET T=0.5
76   LET A=0
78   LET B=0
80   LET F=1
82   LET C=INT(RND(0)*2)+1
85   PRINT"NAME OF PLAYER #2";
90   INPUT B$
95   GOSUB 450
```

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```
100   LET X=1
105   FOR Y=1TO13:FOR Z=1TO4
110   IF A(X)=0 THEN GOTO 125
115   LET X=INT(RND(0)*54)+1
120   GOTO 110
125   LET A(X)=Y
130   PRINT:NEXTZ
135   NEXT Y
140   IF C=2 THEN GOTO 180
150   GOSUB 200
155   PRINTA$;
160   GOSUB 300
165   LET A=A+Q
170   LET C=2
180   GOSUB 200
182   PRINT B$;
184   GOSUB 300
186   LET B=B+Q
188   LET C=1
190   GOTO 150
200   LET T=T+0.5
202   LET S=INT(T)
205   IF S>35 THEN GOTO 235
207   PRINT "TURN #";S
210   PRINT
215   PRINT"SCORE TO DATE"
220   PRINT" ";A$,B$
222   PRINT" ",A,B
225   PRINT
227   PRINT
230   RETURN
235   PRINT"GAME IS OVER"
237   PRINT
240   FOR X=1TO 555
242   NEXT X
245   PRINT"FINAL SCORE"
250   PRINT" ",A$,B$
255   PRINT" ",A,B
260   IF A=B THEN GOTO 280
265   IF A>B THEN PRINT A$;
270   IF A<B THEN PRINT B$;
275   PRINT" WINS!"
277   END
280   PRINT"HOW ABOUT THAT?! ** A TIE!"
285   END
300   PRINT", YOUR CUT";
```
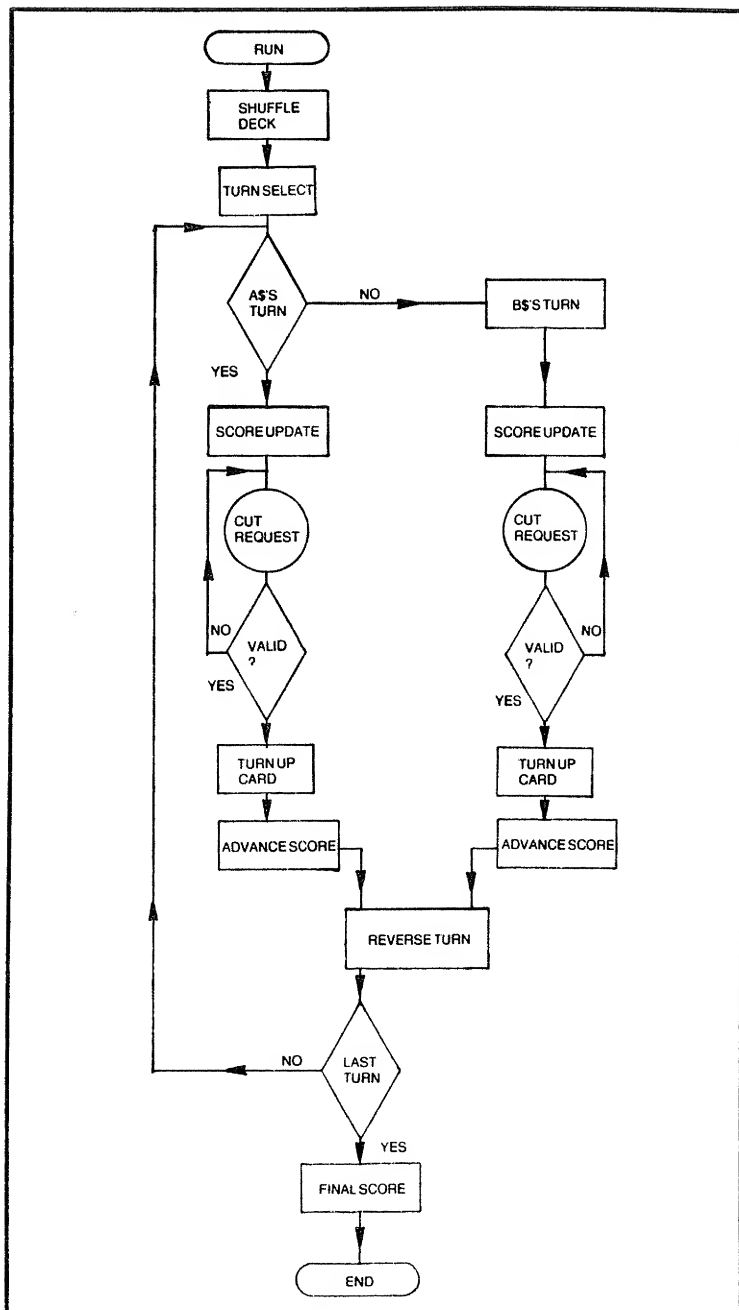
Fig. 2-4. Flowchart for Stack Cut.

```
302  INPUT D
305  LET D=INT(D)
310  IF D>10THEN GOTO 420
315  IF D<1 THEN GOTO 420
320  LET F=F+D
322  FOR X=1 TO 470
324  NEXT X
326  IF F>54 THEN LET F=F-54
330  PRINT"CARD #";E
335  PRINT"YOU DREW ---";
337  LET Q=A(F)
340  FOR X=1 TO 333
342  NEXT X
345  IF Q>10 THEN GOTO 400
350  IF Q<2 THEN GOTO 360
352  PRINT Q
355  RETURN
360  IF Q=-35 THEN GOTO 375
365  PRINT"ACE"
370  RETURN
375  PRINT"JOKER!"
377  FOR X=1 TO 370
380  NEXT X
382  LET G=INT(RND(0)*30)+4
385  FOR X=1 TO G
387  LET Z=INT(RND(0)*1047)+1
390  PRINT AT Z, "   HA!   ";
392  FOR Y=1 TO 75
394  NEXT Y
396  NEXT X
398  RETURN
400  IF Q=11 THEN PRINT "JACK"
405  IF Q=12 THEN PRINT "QUEEN"
410  IF Q=13 THEN PRINT "KING"
415  RETURN
420  PRINT"PLEASE DO NOT CHEAT, ";
425  IF C=1 THEN PRINT A$
430  IF C=2 THEN PRINT B$
435  GOTO 300
450  FOR X=1 TO 13
455  LET Y=INT(RND(0)*54)+1
460  IF A(Y)=0 THEN GOTO 470
465  GOTO 455
470  LET A(Y)=X
475  NEXT X
480  RETURN
```

```
10   CLS
15   F.X=1TO54:A(X)=0:N.X
20   P.:P.""," ","STACK CUT":P.
25   X=RND(54)
30   A(X)=-35
35   X=RND(54)
40   IF A(X)<0 G.35
45   A(X)=-35
50   IN."NAME OF PLAYER #1";A$
55   GOS.450
60   GOS.450
65   T=0.5:F=1
70   A=0:B=0
75   C=RND(2)
80   IN."NAME OF PLAYER #2";B$
85   GOS.450
90   X=1
95   F.Y=1TO13:F.Z=1TO4
100  IF A(X)=0 G.115
105  X=RND(54)
110  G.100
115  A(X)+y:N.Z
120  N.Y
130  CLS
140  IF C=2 G.180
150  GOS.200
155  P.A$;
160  GOS.300
165  A=A+Q
170  C=2
180  GOS.200
185  P.B$;:GOS.300
190  B=B+Q:C=1
195  G.150
200  T=T+0.5:S=INT(T)
205  IF S>35 G.235
210  P."TURN #";S:P.
215  P."SCORE TO DATE"
220  P."",A$,B$
225  P."",A,B:P.:P.
230  RET.
235  P."GAME IS OVER":P.
240  F.X=1TO555:N.X
245  P."FINAL SCORE"
250  P."",A$,B$
```

```
255   P."  ",A,B
260   IF A=B G.280
265   IF A>B P.A$;
270   IF A<B P.B$;
275   P." WINS!":END
280   P."HOW ABOUT THAT?! ** A TIE!"
285   END
300   IN.", YOUR ÇUT";D
305   D=INT(D)
310   IF D>10 G.420
315   IF D<1 G.420
320   F=F+D:F.X=1TO 470:N.X
325   IF F>54 THEN F=F-54
330   P."CARD #";F
335   P."YOU DREW ---";
340   Q=A(F):F.X=1TO333:N.X
345   IF Q>10 G.400
350   IF Q<2 G.360
355   P.Q:RET.
360   IF Q=-35 G.375
365   P."ACE"
370   RET.
375   P."JOKER!"
380   F.X=1TO470:N.X:G=RND(30)+3
385   F.X=1TOG:Z=RND(1047)
390   P.ATZ,"HA!    ";
395   F.Y=1TO75:N.Y:N.X:RET.
400   IF Q=11 P."JACK"
405   IF Q=12 P."QUEEN"
410   IF Q=13 P."KING"
415   RET.
420   P."PLEASE DO NOT CHEAT, ";
425   IF C=1 P.A$
430   IF C=2 P.B$
435   G.300
450   F.X=1TO13
455   Y=RND(54)
460   IF A(Y)=0 G.470
465   G.455
470   A(Y)=X
475   N.X
480   RET.
```

Sample Run (Excerpt)

                    STACK CUT
NAME OF PLAYER #1? RALPH

NAME OF PLAYER #2? POTSIE
TURN #1
SCORE TO DATE
RALPH   POTSIE
0   0
RALPH, YOUR CUT? 5
CARD #6
YOU DREW --- QUEEN
TURN #1
SCORE TO DATE
RALPH   POTSIE
12   0
POTSIE, YOUR CUT? 10
CARD #16
YOU DREW --- 3
TURN #2
SCORE TO DATE
RALPH   POTSIE
12   3
RALPH, YOUR CUT? 3
CARD #19
YOU DREW --- 5
TURN #2
SCORE TO DATE
RALPH   POTSIE
17   3
POTSIE, YOUR CUT? 54
PLEASE DO NOT CHEAT, POTSIE
YOUR CUT? 8
CARD #27
YOU DREW --- 6
TURN #3
SCORE TO DATE
RALPH   POTSIE
17   9
RALPH, YOUR CUT? 5
CARD #32
YOU DREW --- JOKER!
              HA!   HA!   HA!
                 HA! HA!   HA!
   HA!
                 HA!   HA!
TURN #3
SCORE TO DATE
RALPH   POTSIE
−18   9

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POTSIE, YOUR CUT? 10
CARD #42
YOU DREW --- ACE
TURN #4
SCORE TO DATE
RALPH   POTSIE
−18   10

                                *****

TURN #35
SCORE TO DATE
RALPH   POTSIE
212   203
POTSIE , YOUR CUT? 4
CARD #6
YOU DREW --- QUEEN
GAME IS OVER
FINAL SCORE
RALPH   POTSIE
212   215
POTSIE WINS!

Variables Used

A$ PLAYER #1
B$ PLAYER #2
A   A$'S SCORE
B   B$'S SCORE
C   TURN SELECT
D   CUT CHOICE
F   CARD #
G   "HA!" COUNT
Q   TOP CARD VALUE
S   TURN COUNT
T   TURN COUNT
X   TIMING & MISC.
Y   TIMING & MISC.
Z   "HA!" LOCATION

Chapter 3
Frustration
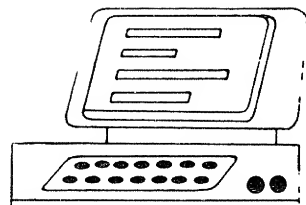
This game merits a chapter all to itself since it has four versions.

The object of *Frustration* is to move your marker through the hundred-space grid from the first space to the hundredth. Each space has a concealed value, usually from -10 to $+10$ points, but some are booby traps that send you back to the starting position (that's the frustrating part). There is also one bomb, and if you hit it the game ends immediately.

Since you want to reach the end position with as high a score a possible, you might want to deliberately land on a booby trap to pick up more points. But the computer also keeps track of how many moves you take. Develop your own par for reaching the end, in as few moves possible, with the highest score.

The two-player version repeats the main game program (which is a solitaire version), so that you can match your skill and luck against your opponent. Player number 2 moves from the hundredth space to the first, otherwise the rules are the same as the one-player version—with one addition. If you land on a space already occupied by your opponent, he must return to his starting position.

The third version of *Frustration* has the computer taking the part of your opponent. It is programmed not to cheat: in deciding its moves it only knows what's under a space if that space has already been played. But once it learns what's at a space, you can be sure it doesn't forget!

The fourth version is a sort of ultimate. Again a two-player game is played, but this time the computer plays both sides: you

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just sit back and watch. If the other versions of the game get too frustrating, it can help to watch the computer have as much trouble with it as you do.

As frustrating as this game is, it appears to be addictive. I've tried it on several people, and once started they can't seem to leave it alone.

In all versions each move is from 1 to 6 spaces.

No sample run is given for the last two versions, because they'd look essentially like the two-player version, for which a sample run is given. See Fig. 3-1 for the flowchart.
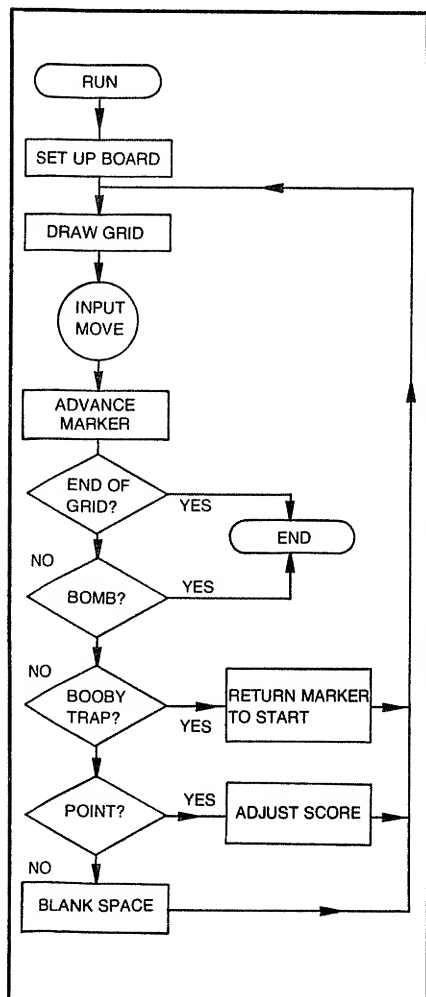

Fig. 3-1. Frustration Flowchart.

Main Game Program

```
  5   FOR X=1 TO 100
  7   PRINT
 10   LET A(X)=0
 12   NEXT X
 15   PRINT" ","FRUSTRATION!":PRINT:PRINT
 17   REM * PLANT POINTS *
 20   FOR X=1 TO 50
 22   LET Y=INT(RND(0)*98)+2
 24   LET Z=INT(RND(0)*21)-10
 26   LET A(Y)=Z:NEXT X
 28   REM * PLANT BOOBY TRAPS *
 30   FOR X=1TO13
 32   LET Y=INT(RND(0)*90)-4
 34   LET A(Y)=-50:N.X
 36   REM * PLANT BOMB *
 38   LET Y=INT(RND(0)*80)+11
 40   LET A(Y)=-100:LET A(1)=100
 42   LET P=1:LET N=0
 44   LET Q=0:LET S=0
 45   GOSUB 200
 47   REM * THE PLAY *
 50   LET S=S+1
 52   PRINT:PRINT"MOVE #";S,"YOUR SCORE IS ";Q
 54   PRINT"YOUR MOVE ";
 56   INPUT M
 58   LET M=INT(M)
 60   IF M<1 THEN GOTO 240
 65   IF M>6 THEN GOTO 240
 70   LET A(P)=N:LET R=P+M
 72   LET N=A(R)
 74   PRINT"YOU JUST FOUND ";
 76   FOR X=1 TO 333
 78   NEXT X
 80   IF N=0 THEN GOTO 235
 85   IF N<-10 THEN GOTO 245
 90   PRINT N;" POINTS!"
 95   REM * ADJUST SCORE & POSITION *
 97   LET Q=Q+N
100   LET P=R
102   LET A(P)=100
105   FOR X=1 TO 555:NEXT X
107   REM * TEST FOR WIN *
```

```
110   IF P>99 THEN GOTO 120
115   GOTO 45
120   REM* END GAME *
125   GOSUB 200
130   PRINT"YOU MADE IT IN";S;" MOVES!"
135   FOR X=1 TO 333:NEXT X
140   PRINT" AND WITH A SCORE OF";Q
145   IF Q<10 THEN PRINT "THAT STINKS!"
150   IF Q>50 THEN PRINT "FANTASTIC!"
155   END
200   REM* DRAW GRID *
202   LET J=0
205   FOR X=1 TO 10
206   PRINT" ",
208   FOR Y=1 TO 10
210   LET J=J+1
212   IF A(J)=100 THEN GOTO 230
215   PRINT "X";
220   NEXT Y
222   PRINT
224   NEXT X
226   PRINT:PRINT
228   RETURN
230   PRINT "O";
232   GOTO 220
235   PRINT "ABSOLUTELY NOTHING"
237   GOTO 100
240   PRINT"INVALID MOVE"
242   GOTO 54
245   IF N=−100 THEN GOTO 260
247   PRINT"A BOOBY TRAP!"
250   LET N=0
252   LET P=1
254   LET A(P)=100
256   GOTO 105
260   PRINT"THE BOMB"
265   FOR X=1TO470:NEXT X
270   FOR X=1TO 4:PRINT:NEXT X
275   PRINT" ","**** BOOM!! ****"
280   FOR X=1TO4:PRINT:NEXT X
285   END
```

TRS-80 BASIC

```
  5   CLS:P.:P.:P.:F.X=1TO100:A(X)=0:N.X
 15   P." ","FRUSTRATION!":P.:P.
 20   F.X=1TO50:Y=RND(98)+1:A(Y)=RND(21)−11:N.X
```

```
25    F.X=1TO13:Y=RND(90)+5:A(Y)=-50:N.X
30    Y=RND(80)+10:A(Y)=-100
40    A(1)=100:P=1:N=0:Q=0:S=0
45    GOS.200
50    S=S+1:P.:P. "MOVE #";S,"YOUR SCORE IS";Q
55    IN."YOUR MOVE";M:IF M<1 G.240
60    IF M>6 B.240
65    M=INT(M):A(P)=N:R=P+M:N=A(R)
70    P."YOU JUST FOUND ";
75    F.X=1TO333:N.X:IF N=0 G.235
80    IF N<-10 G.245
90    P.N;" POINTS!"
95    Q=Q+N
100   P=R:A(P)=100
105   F.X=1TO555:N.X
110   IF P>99 G.120
115   G.45
120   GOS.200:P."YOU MADE IT IN ";S;" MOVES!"
122   F.X=1TO333:N.X
125   P."AND WITH A SCORE OF ";Q
130   IF Q<10 P."THAT STINKS!"
135   IF Q>50 P."FANTASTIC!"
140   END
200   J=0:F.X=1TO 10:P." "
205   F.Y=1TO10:J=J+1
210   IF A(J)=100 G.230
215   P."X";
220   N.Y:P.:N.X:P.:RET.
230   P."O";:G.220
235   P."ABSOLUTELY NOTHING!":G.100
240   P."INVALID MOVE":G.55
245   IF N=-100 G.260
250   P."A BOOBY TRAP!"
255   N=0:P=1:A(P)=100:G.105
260   P."THE BOMB":F.X=1TO470:N.X
265   P.:P.:P.:P.:P." ","**** BOOM!! ****"
270   P.:P.:P.:P.
275   END
```

Summary of Variables Used

J   GRID POSITION
M   MOVE
N   VALUE OF OCCUPIED SPACE
P   POSITION
Q   SCORE
R   NEW POSITION

S   MOVE #
X   TIMING
Y   VARIOUS

Sample Run (Excerpt)

```
            FRUSTRATION
            O X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
```
MOVE #1   YOUR SCORE IS 0
YOUR MOVE? 6
YOU JUST FOUND – 10 POINTS!
```
            X X X X X X O X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
```
MOVE #2   YOUR SCORE IS – 10
YOUR MOVE? 6
YOU JUST FOUND 2 POINTS!
```
            X X X X X X X X X X
            X X O X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
            X X X X X X X X X X
```
MOVE #3   YOUR SCORE IS – 8
YOUR MOVE? 6
YOU JUST FOUND A BOOBY TRAP

```
          O X X X X X X X X X
          X X X X X X X X X X
          X X X X X X X X X X
          X X X X X X X X X X
          X X X X X X X X X X
          X X X X X X X X X X
          X X X X X X X X X X
          X X X X X X X X X X
          X X X X X X X X X X
          X X X X X X X X X X
MOVE #4        YOUR SCORE IS – 8
YOUR MOVE?
```

Two Man Frustration

Standard BASIC

ENTER THE MAIN GAME PROGRAM, THEN ADD
THE FOLLOWING STEPS:

```
 16   PRINT"PLAYER #1";
 18   INPUT A$
 27   PRINT"PLAYER #2";
 29   INPUT B$
 35   GOSUB 500
 52   PRINT:PRINT A$;"MOVE #";S,"YOUR SCORE IS ";Q
 82   IF N=200 THEN GOTO 290
110   IF P>99 THEN GOTO 400
115   GOTO 300
155   RETURN
213   IF A(J)=200 THEN GOTO 490
290   LET A(C)=B:LET A(100)=200
292   LET C=100:LET B=0
294   LET N=0
296   PRINT B$
298   GOTO 100
300   GOSUB 200
305   PRINT:PRINT B$;" MOVE #";S,"YOUR SCORE IS ";A
310   PRINT"YOUR MOVE";
312   INPUT M
315   IF M<1 THEN GOTO 460
320   IF M>6 THEN GOTO 460
325   LET A(C)=B:LET R=C−M
330   LET B=A(R)
333   PRINT" YOU JUST FOUND ";
335   FOR X=1 TO 333:NEXT X
340   IF B=0 THEN GOTO 440
345   IF B<−10 THEN GOTO 445
350   IF B=100 THEN GOTO 465
355   PRINT B;" POINTS!"
360   LET A=A+B
365   LET C=R:LET A(C)=200
370   FOR X=1 TO 555:NEXT X
375   IF C<2 THEN GOTO 405
380   GOTO 45
400   PRINT A$
402   GOTO 410
405   PRINT B$
410   PRINT" MADE IT IN ";S;" MOVES"
412   GOSUB 200
```

```
415    PRINT:PRINT" "," FINAL SCORE"
420    PRINT A$,Q
422    GOSUB 145
425    PRINT:Q=A
430    PRINT B$,Q
432    GOSUB 145
435    END
440    PRINT"ABSOLUTELY NOTHING"
442    GOTO 365
445    IF B=-100 THEN GOTO 260
450    PRINT"A BOOBY TRAP!"
452    LET B=0:LET C=100
454    LET A(C)=200
457    GOTO 370
460    PRINT"INVALID MOVE"
462    GOTO 310
465    LET A(P)=N:LET A(1)=100
470    LET N=0:LET B=0
475    LET P=1
480    PRINT A$
485    GOTO 365
490    PRINT"8 ";
495    GOTO 220
500    LET A=0:LET B=0
505    LET C=100
510    LET A(100)=200
515    PRINT
520    RETURN
```

STEPS 120 to 125 are not used in this
version and may be eliminated.

TRS-80 BASIC

ENTER THE MAIN GAME PROGRAM THEN ADD THE
FOLLOWING STEPS:

```
 22    IN."PLAYER #1";A$
 27    IN."PLAYER #2";B$
 42    A=0:B=0:C=100:A(100)=200:P.
 50    S=S+1:P.:P.A$;" MOVE #";S,"YOUR SCORE IS ";Q
 85    IF N=200 G.290
110    IF P>99 G.400
115    G.300
140    RET.
212    IF A(J)=200 G.285
285    P."8 ";:G.220
290    A(C)=B:A(100)=200:C=100:B=0:N=0
```

```
295  P.B$:G.100
300  GOS.200
305  P.:P.B$" MOVE #";S,"YOUR SCORE IS";A
310  IN."YOUR MOVE";M
315  IF M<1 G.460
320  IF M>6 G.460
325  A(C)=B:R=C−M:B=A(R)
330  P."YOU JUST FOUND ";
335  F.X=1TO333:N.X
340  IF B=0 G.440
345  IF B<−10 G.445
350  IF B=100 G.465
355  P.G;" POINTS!"
360  A=A+B
365  C=R:A(C)=200
370  F.X=1TO555:N.X
375  IF C<2 G.405
380  G.45
400  P.A$;:G.410
405  P.B$;
410  P."MADE IT IN ";S;" MOVES":GOS.200
415  P.:P." ","FINAL SCORE"
420  P.A$,Q:GOS.130
425  P.:Q=A
430  P.B$,Q:GOS.130
435  END
440  P."ABSOLUTELY NOTHING":G.365
445  IF B=−100 G.260
450  P."A BOOBY TRAP!"
455  B=0:C=100:A(C)=200:G.370
460  P."INVALID MOVE":G.310
465  A(P)=N:A(1)=100:N=0:P=1:B=0
470  P.A$:G.365
```

Steps 120 & 125 of the Main Game Program are
bypassed in this version, and may be eliminated.

Summary of Variables Used

A$ PLAYER #1
B$ PLAYER #2
A   B$'S SCORE
B   VALUE OF B$'S SPACE
C   B$'A POSITION
J   GRID POSITION
M   MOVE
N   VALUE OF A$'S SPACE

P   A$'S POSITION
Q   A$'S SCORE
R   NEW SPACE
S   MOVE #
Y   TIMING
Y   VARIOUS

Two-Player Version Sample Run (Excerpt)

```
                    FRUSTRATION
PLAYER #1? HOMER
PLAYER #2? JETHRO
                    O X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X 8
HOMER MOVE #1            YOUR SCORE IS 0
YOUR MOVE ? 5
YOU JUST FOUND 3 POINTS!
                    X X X X X O X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X 8
JETHRO MOVE #1          YOUR SCORE IS 0
YOUR MOVE? 6
YOU JUST FOUND – 5 POINTS!
                    X X X X X O X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
```

```
                    X X X X X X X X X
                    X X X 8 X X X X X X
HOMER MOVE #2            YOUR SCORE IS 3
YOUR MOVE? 4
YOU JUST FOUND ABSOLUTELY NOTHING
                    X X X X X X X X X O
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X 8 X X X X X X
JETHRO MOVE #2          YOUR SCORE IS – 5
YOUR MOVE? 6
YOU JUST FOUND 5 POINTS!
                    X X X X X X X X X O
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X X X X
                    X X X X X X X 8 X X
                    X X X X X X X X X X
HOMER MOVE #3           YOUR SCORE IS 3
YOUR MOVE?
```

Frustration vs. The Computer

TRS-80 BASIC

ENTER MAIN PROGRAM, THEN ADD THE FOLLOWING:

```
 35   A=0:B=0:C=100:A(100)=200
 42   FOR X=101 TO 200:A(X)=0:N.X
 85   IF N=200 G.290
110   IF P>99 G.405
115   G.300
      ELIMINATE STEPS 120 TO 140
212   IF A(J)=200 G.285
285   P."8";:G.220
290   A(C)=B:A(100)=100:B=0:N=0
295   P."ME":G.100
300   P."I'LL MOVE ";
305   E=C-6:F=0:G=E+100:D=C-1:U=E+100:V=D+100
310   FOR X=UTOV
312   IF A(X)> F GOS.460
315   N.X:G=G-100:H=C-G:P.H
320   F.X=1TO555:N.X
330   P.:P."I JUST FOUND ";
335   A(C)=B:B=A(G):A(G+100)=B
340   IF B=100 G.390
345   IF B=0 G.385
350   IF B<-10 G.450
355   P. B;" POINTS!"
360   A=A+B
365   C=G:A(C)=200
370   FOR X=1TO555:N.X
375   IF C<2 G.410
380   G.45
385   P."ABSOLUTELY NOTHING.":G.365
390   A(P)=N:A(1)=100:P=1:N=0:B=0:P."YOU":G.365
395   P."A BOOBY TRAP!":A(100)=200:B=0
400   C=100:G.370
405   P."YOU";:G.415
410   P."I";
415   P."MADE IT IN ";S;"MOVES"
420   GOS.200
425   P.:P."","FINAL SCORE":P.
430   P."YOU",Q
435   P."ME",A
440   END
450   IF B=-100 G.260
```

```
455   G.395
460   F=A(X):G=X:RET.
```

Standard BASIC

ENTER THE MAIN GAME PROGRAM THEN ADD
THE FOLLOWING STEPS:

```
 43   GOSUB 470
 82   IF N=200 THEN GOTO 290
110   IF P>99 THEN GOTO 405
115   GOTO 300
                ELIMINATE STEPS 120 TO 155
213   IF A(J)=200 THEN GOTO 490
290   LET A(C)=B:LET A(100)=200
292   LET C=100:LET B=0:LET N=0
294   PRINT"ME"
296   GOTO 100
300   PRINT"I'LL MOVE ";
302   LET E=C-6:LET F=0
304   LET G=E+100:LET D=C-1
306   LET U=E+100:LET V=D+100
308   FOR X=U TO V
310   IF A(X)>F THEN GOSUB 445
315   NEXT X
317   LET G=G-100:LET H=C-G
320   PRINT H
322   FOR X=1 TO 555:NEXT X
325   PRINT:PRINT"I JUST FOUND ";
330   LET A(C)=B:LET B=A(G)
335   LET X=G+100:LET A(X)=B
340   IF B=100 THEN GOTO 390
345   IF B=0 THEN GOTO 385
350   IF B<-10 THEN GOTO 450
355   PRINT B;" POINTS!"
360   LET A=A+B
365   LET C=G:LET A(C)=200
370   FOR X=1 TO555:NEXT X
375   IF C<° THEN GOTO 410
380   GOTO 45
385   PRINT"ABSOLUTELY NOTHING."
387   GOTO 365
390   LET A(P)=N:LET A(1)=100
392   LET P=1:LET N=0:LET B=0
394   PRINT "YOU": GOTO 365
395   PRINT"A BOOBY TRAP!"
400   LET A(100)=200:LET B=0:LET C=100
402   GOTO 370
```

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```
405   PRINT"YOU ";
407   GOTO 415
410   PRINT"I ";
415   PRINT"MADE IT IN ";S;" MOVES"
420   GOSUB 200
425   PRINT:PRINT" ","FINAL SCORE"
430   PRINT:PRINT"YOU",Q
435   PRINT"ME",A
440   END
450   IF B=-100 THEN GOTO 260
455   GOTO 395
460   LET F=A(X):LET G=X
465   RETURN
470   LET A=0:LET B=0
475   LET C=100:LET A(100)=200
480   FOR X=101 TO 200
482   LET A(X)=0
484   NEXT X
486   RETURN
490   PRINT"8";
495   GOTO 220
```

The Computer vs. Itself

Standard BASIC

```
  5  PRINT:PRINT"","FRUSTRATION!"
  7  REM* SET UP BOARD *
 10  FOR X =1 TO 300
 12  LET A(X)=0
 14  NEXT X
 16  FOR X=1 TO 50
 18  LET Y=INT(RND(0)*98)+2
 20  LET A(Y)=INT(RND(0)*21)−10
 22  NEXT X
 24  FOR X=1 TO 13
 26  LET Y=INT(RND(0)*90)+6
 28  LET A(Y)=−50
 30  NEXT X
 32  LET A(1)=100:LET P=1
 34  LET N=0:LET Q=0:LET S=0
 36  LET A=0:LET B=0
 38  LET C=100:LET A(C)=200
 40  REM * THE PLAY*
 42  GOSUB 265
 44  LET S=S+1
 46  PRINT"MOVE # ";S,"PLAYER 1 MOVES";
 50  LET E=P+6:LET F=0
 52  LET G=E+100:LET D=P+1
 54  LET U=D+100:LET V=G
 56  FOR X=U TO V
 58  IF A(X)>F THEN GOSUB 200
 60  NEXT X
 62  LET G=G−100:LET M=G−P
 64  PRINT M
 66  FOR X=1TO 555:NEXT X
 70  PRINT"I JUST FOUND ";
 75  LET A(P)=N:LET N=A(G)
 80  LET X=G+100:LET A(G)=N
 85  IF N=200 THEN GOTO 205
 90  IF N=−50 THEN GOTO 225
 95  PRINT N;" POINTS!"
100  LET Q=Q+N
105  LET P=G:LET A(P)=100
110  FOR X=1 TO 470:NEXT X
115  IF P>99 THEN GOTO 235
120  GOSUB 265
```

```
122    PRINT"PLAYER 2 MOVES";
124    LET E=C-6:LET F=0
126    LET G=E+200:LET D=C-1
128    LET U=E+200:LET V=D+200
130    FOR X=U TO V
135    IF A(X)>F THEN GOSUB 200
140    NEXT X
142    LET G=G-200:LET M=C-G
144    PRINT M
146    FOR X=1 TO 555:NEXT X
148    PRINT "I JUST FOUND";
150    LET A(C)=B
155    LET B=A(G)
160    IF B=100 THEN GOTO 215
165    IF B=-50 THEN GOTO 230
170    PRINT B;" POINTS!"
175    LET A=A+B
180    LET C=G
182    LET A(C)=200
185    FOR X=1 TO 470:NEXT X
190    IF C<2 THEN GOTO 240
195    GOTO 40
200    LET F=A(X):LET G=X
202    RETURN
205    PRINT"PLAYER 2! HA! HA!"
207    LET A(C)=B:LET B=0
210    LET C=100:LET N=0
212    LET A(C)=200:GOTO 105
215    PRINT"PLAYER 1! YUK! YUK!"
217    LET A(P)=N:LET N=0
220    LET B=0:LET P=1:LET A(P)=100
222    GOTO 180
225    LET P=:LET A(P)=100:LET N=0
227    PRINT"A BOOBY TRAP!":GOTO 110
230    LET C=100:LET A(C)=200:LET B=0
232    PRINT"A BOOBY TRAP!":GOTO185
235    PRINT"PLAYER 1";
237    GOTO 245
240    PRINT"PLAYER 2";
245    PRINT" MADE IT IN ";S;" MOVES"
247    GOSUB 265
250    PRINT"FINAL SCORE","PLAYER 1","PLAYER 2"
255    PRINT" ",Q,A
260    END
265    LET J=0
270    FOR X=1 TO 10
```

```
275   PRINT" ",
280   FOR Y=1 TO 10
285   LET J=J+1
290   IF A(J)=100 THEN PRINT"O";
295   IF A(J)=200 THEN PRINT"8";
300   IF A(J)<100 THEN PRINT"X";
305   NEXT Y:PRINT
310   NEXT X:PRINT
315   RETURN
```

TRS-80 BASIC

```
  5   P.:P." ","FRUSTRATION!"
 10   F.X=TO300:A(X)=0:N.X
 15   F.X.=1TO50:Y=RND(98)+1:A(Y)=RND(21)-11:N.X
 20   F.X=1TO13:Y=RND(90)+5:A(Y)=-50:N.X
 30   A(1)=100:P=1:N=0:Q=0:S=0:A=0:B=0:C=100:A(100)=200
 40   GOS.265:S=S+1:P."MOVE #";S,"PLAYER 1 MOVES";
 50   E=P+6:F=0:G=E+100:D=P+1:U=D+100:V=E+100:F.X=
      UTOV
 55   IF A(X)>F GOS.200
 60   N.X:G=G-100:M=G-P:P.M
 65   F.X=1TO555:N.X
 70   P."I JUST FOUND ";
 75   A(P)=N:N=A(G):A(G+100)=N
 80   IF N=200 G.205
 85   IF N=-50 G.225
 90   P.N;" POINTS!"
100   Q=Q+N
105   P=G:A(P)=100
110   F.X=1TO470:N.X
115   IF P>99 G.235
120   GOS.265:P."PLAYER 2 MOVES";
125   E=C-6:F=0:G=E+200:D=C-1:U=E+200:V=D+200:F.X=
      UTOV
130   IF A(X)>F GOS.200
140   N.X:G=G-200:M=C-G:P.M
145   F.X=1TO555:N.X:P."I JUST FOUND ";
150   A(C)=B:B=A(G)
160   IF B=100 GOTO 215
165   IF B=-50 G.230
170   P.B;" POINTS!":A=A+B
180   C=G:A(C)=200
185   F.X=1TO470:N.X
190   IF C< 2 G.240
195   G.40
200   F=A(X):G=X:RET.
205   P."PLAYER 2! HA! HA!":A(C)=B:B=0:N=0
```

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```
210   C=100:A(C)=200:G.105
215   P."PLAYER 1! YUK! YUK!":A(P)=N:N=0:B=0
220   P=1:A(P)=100:G.180
225   P=:A(P)=100:N=0:P."A  BOOBY TRAP!":G.110
230   C=100:A(C)=200:B=0:P."A BOOBY TRAP!":G.185
235   P."PLAYER 1 ";:G.245
240   P."PLAYER 2 ";
245   P."MADE IT IN ";S;" MOVES":GOS.265
250   P."FINAL SCORE","PLAYER 1","PLAYER 2"
255   P." ",Q,A:END
265   J=0:F.X=1TO10:P." ",:F.Y=1TO10:J=J+1
270   IF A(J)=100 P. "0";
275   IF A(J)=200 P."8 ";
280   IF A(J)< 100P."X";
285   N.Y:P.:N.X:P.:RET.
```

Summary of Variables Used

A   PLAYER #2"S SCORE (i.e., THE COMPUTER)
B   VALUE OF 2's SPACE
C   2's POSITION
D   MOVE CHOICE
E   MOVE CHOICE
F   MOVE CHOICE
G   MOVE CHOICE
J   GRID POSITION
M   MOVE
N   VALUE OF PLAYER #1'S SPACE
P   1'S POSITION
Q   1'S SCORE
R   NEW POSITION
S   MOVE #
X   TIMING
Y   VARIOUS
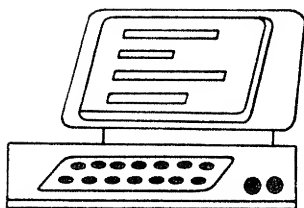
Chapter 4
Non-Games

The programs in this chapter aren't really games at all. One is a random probability demonstration, two are gag programs, and one is a random music composer (it just writes the music, it doesn't play it.)

Coin Flipper

A glance at the listing of this program should tell you that it's a simple one. There are only 25 steps.

Step 10 simply clears the screen and prints the title. Step 15 asks how many times you want the computer to flip the coin: this number is called X and should be a positive integer. After all, how can a coin be flipped −5.7 times? If a negative number or zero is entered, the program will bomb.

If you like, you can block such an invalid entry by adding the following steps:

17 X=INT(X)
18 IF X<1 GOTO 15

Step 20 tests the value of X. If X = 1 the program jumps, to step 115. C is randomly set to equal 1 (Heads) or 2 (Tails). The result is printed and the program cycles back to step 15 to start over.

If step 20 finds X to be greater than 1, the program continues through step 25 which sets variables H (number of Heads) and T (Number of Tails) to zero. These variables are increased by one count each time the appropriate face comes up. Y is counted up to the value of X for the loop program (steps 30 to 55). On each pass through the loop C is randomly set to either 1 or 2. A 1 is counted as Heads (steps 45 and 50), while a 2 is counted as Tails (100 through 110).

After X loops, the total number of Heads and Tails are printed along with their percentages of the total of flips. If X is a reasonably large number, each should be close to 50 %.

The percentage of Heads (A) and of Tails (B) are added (D). If the total does not equal 100%, an error message is printed and the computer stops. This can happen in certain cases because of internal rounding off of extreme decimal places within the computer. If D equals 100%, the program cycles back to step 15 to start over.

If you don't want to bother with the 100% check (the difference should never be more than a very minute fraction anyway), you can eliminate steps 85, 90 and 95, and replace them with

90 GOTO 15

When you want to terminate the program, just hit the BREAK key.

See Fig. 4-1 for the flowchart.
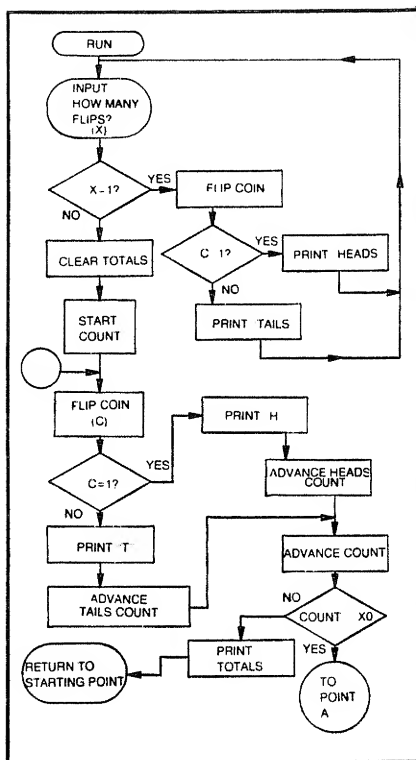
Fig. 4-1. Coin Flipper flowchart.

Standard BASIC

```
10   CLS:PRINT" ", "COIN FLIPPER
15   PRINT"HOW MANY TIMES SHALL I FLIP THAT OLD COIN";
20   INPUT X
25   IF X=1 GOTO 115
30   LET H = 0: LET T= 0
33   PRINT:PRINT:FOR Y=1 TO X
40   LET C=INT(RND(1)*2)+1
45   IF C=2 GOTO 100
50   LET H=H+1:PRINT"H";
55   NEXT Y:PRINT:PRINT
60   PRINT" ","TOTALS"
65   LET A=(H/X)*100:LET B=(T/X)*100:LET D=A+B
70   PRINT"HEADS",H,A;"%"
75   PRINT"TAILS",T,B;"%"
80   PRINT" "," ",D;"%"
85   IF D=100 GOTO 15
90   PRINT"I THINK I GOOFED"
95   END
```

190

```
100    PRINT"T";
105    LET T=T+1
110    GOTO 55
115    LET C=INT(RND(1)*2)+1
120    IF C=1 PRINT"HEADS"
125    IF C=2 PRINT "TAILS"
130    GOTO 15
```

TRS-80 BASIC

```
10     CLS:P.:" ","COIN FLIPPER"
15     IN."HOW MANY TIMES SHALL I FLIP THAT OLD COIN";X
20     IF X=1 G.115
25     H=0:T=0:P.:P.:F.Y=1TOX:C=RND(2)
30     IF C=2 G.100
40     H=H+1:P."H ";
50     N.Y:P.:P.:P." ","TOTALS"
60     A=(H/X)*100:B=(T/X)*100:D=A+B
70     P."HEADS",H,A;"%":P."TAILS",T,B;"%"
80     P." "," ",D;"%"
85     IF D=100 G.15
90     P."I THINK I GOOFED.":END
100    T=T+1:P."T ";
110    G.50
115    C=RND(2):IF C=1P."HEADS"
120    IF C=2P."TAILS"
130    G.15
```

Summary Of Variables Used

A   % of Heads
B   % of Tails
C   Result of current flip
D   A+B (should be 100)
H   Number of Heads
T   Number of Tails
X   Number of flips
Y   Loop count

Sample Run

```
       COIN FLIPPER
HOW MANY TIMES SHALL I  FLIP  THAT OLD COIN? 1
HEADS
HOW MANY TIMES SHALL I FLIP THAT OLD COIN? 25

H T T H T H H T T T H T H T T H
T H T T T H T H H
       TOTALS
HEADS    11     44%
TAILS    14     56%
                100%
```

Favorite Song
Surprise Poem

These two programs are simply computerized gags. Try entering them without thinking about what they'll do. Then you can spring them on your friends.

Since there is no randomness in these programs, it would spoil the joke to include sample runs here.

Once you've run these programs a couple times you should be able to work up similar gag programs of your own.

Favorite Song Standard BASIC

```
  5   LET Y=1:LET N=0:PRINT:PRINT:PRINT:PRINT
 10   PRINT:PRINT:"WOULD YOU LIKE ME TO DO MY FAVORITE
      SONG";
 12   INPUT X
 15   IF X=Y THEN GOTO 100
 20   LET A= INT(RND(0)*300)+1
 22   FOR B=1 TO A
 24   LET C=INT(RND(0)*300)+1
 26   FOR D=1 TO C:NEXT D
 28   PRINT" FINK! ";
 30   LET E=INT(RND(0)*20)+1
 35   FOR F=1 TO E:PRINT" ";
 40   NEXT F:NEXT B
 45   END
 70   IF X=1 THEN PRINT"ONE BOTTLE ";
 75   IF X>1 THEN PRINT X;" BOTTLES ";
 80   RETURN
 85   PRINT"OF BEER ";
 90   RETURN
100   FOR A=1 TO 30:PRINT: NEXT A
102   PRINT " ","OOOHHH...":PRINT:PRINT:PRINT
105   PRINT:FOR A=1 TO 400:NEXT A
107   LET X=99
110   FOR A=1 TO 20:PRINT:NEXT A
112   FOR A=1TO333:NEXT A
114   GOSUB 70
116   GOSUB 85
118   GOSUB 190
120   PRINT:FOR A=1 TO 270:NEXT A
122   GOSUB 70
124   GOSUB 85
```

```
126   PRINT
128   PRINT
130   FOR A=1 TO 300:NEXT A
132   PRINT"IF ONE OF THOSE BOTTLES SHOULD HAPPEN TO
      FALL"
134   PRINT:FOR A=1TO 250:NEXT A
136   LET X=X-1
138   IF X=0 THEN GOTO 200
140   GOSUB 70
142   GOSUB 85
144   GOSUB 190
146   FOR A=1TO 777:NEXT A
150   PRINT:PRINT:PRINT
155   PRINT:PRINT:PRINT
160   GOTO 112
190   PRINT"ON THE WALL"
195   RETURN
200   PRINT"NO MORE BOTTLES";
205   GOSUB 85
210   GOSUB 190
215   FOR A=1 TO 999:NEXT A
220   PRINT:PRINT:PRINT
225   PRINT:PRINT:PRINT
230   PRINT"WANT ME TO DO IT AGAIN";
235   GOTO 12
```

TRS-80 BASIC

```
 55   CLS:Y=1:N=0:P.:P.:P.
 10   IN."WOULD YOU LIKE ME TO DO MY FAVORITE SONG";x
 15   IF X=Y G.100
 20   C=RND(300):F.D=1TOC:A=RND(300):F.B=1TOA
 25   N.B:P." FINK! ";:E=RND(20):F.B=1TOE:P." ";
 30   N.B:N.D:END
 70   IF X=1 P."ONE BOTTLE ";
 75   IF X>1 P.X;" BOTTLES ";
 80   RET.
 85   P."OF BEER";:RET.
100   F.A=1TO30:P.:N.A:P." ","OOOHHH...":P.:P.:P.
105   F.A=1TO400:N.A:X=99
110   CLS:P.:P.:P.
115   F.A=1TO333:N.A:GOS.70:GOS.85:GOS.190:P.
120   F.A=1TO270:N.A:GOS.70:GOS.85:P.:P.
125   F.A=1TO300:N.A:P."IF ONE OF THOSE BOTTLES";
130   P."SHOULD HAPPEN TO FALL":P.:F.A=1TO250
135   N.A:X=X-1:IF X=0 G.200
140   GOS.70:GOS.85:GOS.190:F.A=1TO777:N.A
```

```
145   P.:P.:P.:P.:P.:G.115
190   P."ON THE WALL' :RET.
200   P."NO MORE BOTTLES";:GOS.85:GOS.190
205   F.A=1TO999:N.A:P.:P.:P.:P.:P.
210   IN."WANT ME TO DO IT AGAIN";X
215   G.15
```

Surprise Poem Standard BASIC

```
 5    FOR X=1 TO 30
10    PRINT:NEXT X
12    GOSUB 315
14    GOSUB 225
16    GOSUB 255
17    GOSUB 320
18    GOSUB 280
19    GOSUB 220
20    GOSUB 320
21    GOSUB 295
22    GOSUB 320
24    GOSUB 285
26    GOSUB 320
28    GOSUB 270
30    GOSUB 320
32    GOSUB 260
34    GOSUB 315
36    PRINT:PRINT
38    GOSUB 320
40    GOSUB 225
42    GOSUB 320
44    GOSUB 245
50    GOSUB 320
52    GOSUB 225
54    PRINT"N";:GOSUB 320
56    GOSUB 200
58    GOSUB 320
60    GOSUB 230
62    GOSUB 320
64    GOSUB 205
66    GOSUB 320
68    GOSUB 215
70    GOSUB 315
72    PRINT:PRINT
74    GOSUB 320
76    PRINT" ",;GOSUB 225
78    GOSUB 320
80    GOSUB 250
82    GOSUB 320
```

```
 84   GOSUB 300
 86   GOSUB 320
 87   GOSUB 325
 88   GOSUB 320
 90   GOSUB 290
 92   GOSUB 265
 94   PRINT" ":GOSUB 320
 96   PRINT:GOSUB 320
 98   GOSUB 320
100   PRINT" ",:GOSUB 310
102   GOSUB 320
104   GOSUB 210
108   GOSUB 240
112   GOSUB 235
114   GOSUB 320
116   GOSUB 305
120   GOSUB 265
122   GOSUB 315
124   PRINT:PRINT
126   GOSUB 320
128   GOSUB 225
130   GOSUB 255
131   GOSUB 320
132   GOSUB 280
133   GOSUB 220
134   GOSUB 320
135   GOSUB 295
136   GOSUB 320
138   GOSUB 285
142   GOSUB 270
144   GOSUB 320
146   GOSUB 260
148   GOSUB 315
150   PRINT:PRINT
152   GOSUB 320
154   PRINT" ",:GOSUB 300
156   GOSUB 275
158   GOSUB 320
160   PRINT:PRINT" "," ",
162   GOSUB 320
164   GOSUB 300
166   GOSUB 275
168   PRINT"!":PRINT
170   GOSUB 315
172   GOSUB 315
175   END
```

```
200  PRINT" A";
202  RETURN
205  PRINT"BEGE";
207  RETURN
210  PRINT" BOW-";
212  RETURN
215  PRINT" CAN";:RETURN
220  PRINT"EYE";:RETURN
225  PRINT" I";:RETURN
230  PRINT" GAR";:RETURN
235  PRINT"GED";:RETURN
240  PRINT"LEG";:RETURN
245  PRINT" LIVE";:RETURN
250  PRINT" LOVE";:RETURN
255  PRINT"M";:RETURN
260  PRINT" MAN";:RETURN
265  PRINT"MIN";:RETURN
270  PRINT"OR";:RETURN
275  PRINT"OT";:RETURN
280  PRINT" POP";:RETURN
285  PRINT" SAIL";:RETURN
290  PRINT" SWIM";:RETURN
295  PRINT" THE";:RETURN
300  PRINT" TO";:RETURN
305  PRINT" WI";:RETURN
310  PRINT" WITH";:RETURN
315  FOR X=1 TO 222
317  NEXT X
320  FOR X=1 TO 55:NEXT X
322  RETURN
325  PRINT" GO";:RETURN
```

TRS-80 BASIC

```
  5  CLS:P.:P.:P.:GOS.315
 10  GOS.225:GOS.255:GOS.320:GOS.280:GOS.220:GOS.320:
     GOS.295:GOS.320
 15  GOS.285:GOS.270:GOS.320:GOS.260
 20  GOS.315:P.:P.:GOS.320:GOS.225:GOS.320
 25  GOS.245:GOS.320:GOS.225
 30  P."N";:GOS.320:GOS.200:GOS.320:GOS.230
 35  GOS.205:GOS.320:GOS.215:GOS.315:P.:P.:GOS.320
 40  P." ",:GOS.225:GOS.320:GOS.250:GOS.320
 45  GOS.300:GOS.320:GOS.325:GOS.320:GOS.290:GOS.265
 50  P."";:GOS.320:P.:GOS.320:GOS.320
 55  P." ",:GOS.310:GOS.320:GOS.210
 60  GOS.240:GOS.235:GOS.320:GOS.305
```

```
 65   GOS.265:GOS.315:P.:P.:GOS.320
 70   GOS.225:GOS.255:GOS.320:GOS.280:GOS.220:
      GOS.320:GOS.295:GOS.320
 75   GOS. 285:GOS.270:GOS.320:GOS.260
 80   GOS. 315:P.:P.:GOS.320:P." ",:GOS.300
 85   GOS.275:GOS.320:P.:P." "," ",
 90   GOS.320:GOS.300:GOS.275:P."!":P.:P.
 95   GOS.315:GOS.315
100   END
200   P." A";:RET.
205   P."BEGE";:RET.
210   P."BOW-";:RET.
215   P." CAN";:RET.
220   P."EYE";:RET
225   P." I";:RET.
230   P." GAR";:RET.
235   P."GED";:RET.
240   P."LEG";:RET.
245   P." LIVE";:RET.
250   P." LOVE";:RET.
255   P."'M";:RET.
260   P." MAN";:RET.
265   P."MIN";:RET.
270   P."OR";:RET.
275   P."OT";:RET.
280   P." POP";:RET.
285   P." SAIL";:RET.
290   P." SWIM";:RET.
295   P." THE";:RET.
300   P." TO";:RET.
305   P." WI";:RET.
310   P." WITH";:RET.
315   F.X=1TO222:N.X
320   F.X=1TO55:N.X:RET.
325   P." GO";:RET.
```

Tunesmith

This program is a very simple random music composer. It prints out notes by their letter names, gives the note lengths (½, ¼, ⅛, etc.), and indicates the overall dynamic level of the phrase. You may manually convert this information into standard musical notation to play it on any instrument you choose.

While the notes are randomly selected, the selection process is weighted (steps 10 to 45) so that the phrase will tend to stay in the key of C.

In all probability many of the phrases produced by this simple program won't sound very musical, but many are interesting, and some sound quite good.

While this program is too simplistic to be of much use as a real compositional aid, it might suggest themes to a composer with a reluctant muse. *Tunesmith* (like all of these programs) is mostly intended for fun.

See Fig. 4-2 for the sample run in standard musical notation and Fig. 4-3 for the flowchart.

Standard BASIC

```
10   DATA 1,0,1,2,13,8,6,1,3,4
15   DATA 1,0,5,6,7,1,8,10,13,6
20   DATA 1,13,8,12,10,11,1,9,13,3
25   DATA 1,1,0,13,12,8,6,5,1,0
30   DATA 5,13,1,3,5,13,10,8,6,1
35   FOR X=1TO50
37   READ Q
40   PRINT
```


Fig. 4-2. Tunesmith sample run in standard musical notation.

Fig. 4-3. Tunesmith flowchart.
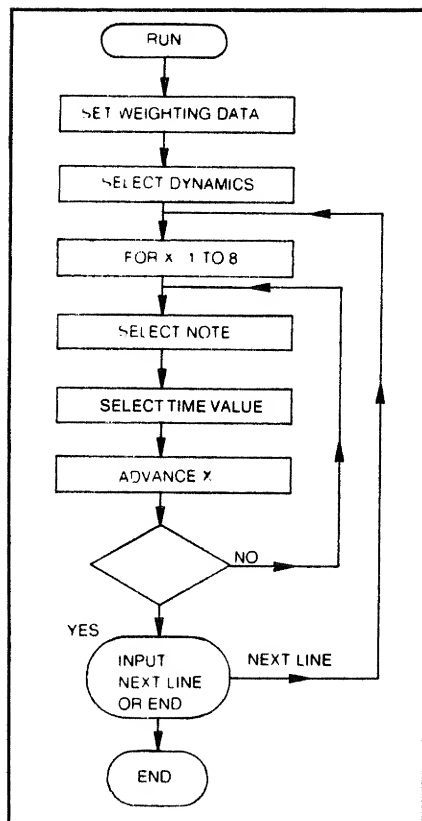
```
 42   LET A(X)=Q
 45   NEXT X
 50   REM* DYNAMICS KEY *
 55   LET F=INT(RND(0)*7)+1
 60   IF F=1 THEN PRINT "PP"
 65   IF F=2 THEN PRINT "P"
 70   IF F=3 THEN PRINT "MP"
 75   IF F=4 THEN PRINT "MF"
 80   IF F=5 THEN PRINT "MF"
 85   IF F=6 THEN PRINT "F"
 90   IF F=7 THEN PRINT "FF"
 95   PRINT
100   FOR X=1 TO 8
105   LET M=INT(RND(0)*50)+1
110   LET Q=A(M)
112   IF Q=0 THEN PRINT "REST ";
115   IF Q=1 THEN PRINT "C      ";
```

199

```
120   IF Q=2 THEN PRINT"C#     ";
125   IF Q=3 THEN PRINT"D      ";
130   IF Q=4 THEN PRINT"D#     ";
135   IF Q=5 THEN PRINT"E      ";
140   IF Q=6 THEN PRINT"F      ";
145   IF Q=7 THEN PRINT"F#     ";
150   IF Q=8 THEN PRINT"G      ";
155   IF Q=9 THEN PRINT"G#     ";
160   IF Q=10 THEN PRINT"A     ";
165   IF Q=11 THEN PRINT"A#    ";
170   IF Q=12 THEN PRINT "B    ";
175   IF Q=13 THEN PRINT"C     ";
180   IF Q=0 THEN GOTO 195
185   LET B=INT(RND(0)*10)+1
190   IF B>7 THEN PRINT"-";
195   NEXT X
200   PRINT:PRINT
202   FOR X=1TO8
205   LET T=INT(RND(0)*9)+1
207   IF T=1 THEN PRINT"1/16";
210   IF T=2 THEN PRINT"1/8 ";
215   IF T=3 THEN PRINT"¼    ";
220   IF T=4 THEN PRINT"¼    ";
225   IF T=5 THEN PRINT"⅛    ";
230   IF T=6 THEN PRINT"½    ";
235   IF T=7 THEN PRINT"¼    ";
240   IF T=8 THEN PRINT"½    ";
245   IF T=9 THEN PRINT"1    ";
250   NEXT X
255   PRINT:PRINT
260   PRINT"TYPE 1 FOR NEXT LINE OR 2 TO END"
265   INPUT H
270   IF H=1 THEN GOTO 100
275   END
```

TRS-80 BASIC

```
10    DATA 1,0,1,2,13,8,6,1,3,4
15    DATA 1,0,5,6,7,1,8,10,13,6
20    DATA 1,13,8,12,10,11,1,9,13,3
25    DATA 1,1,0,13,12,8,6,5,1,0
30    DATA 5,13,1,3,5,13,10,8,6,1
35    F.X=1TO50:READ Q
40    A(X)=Q:N.X
50    CLS:P.:P.
55    F=RND(7):IF F=1 P."PP"
60    IF F=2 P."P"
65    IF F=3 P."MP"
```

```
 70   IF F=4 P. "MF"
 75   IF F=5 P. "MF"
 80   IF F=P. "F"
 85   IF F=7 P. "FF"
 90   P.
100   F.X=1TO8:M=RND(50)
110   Q=A(M);IF Q=0 P. "REST";
115   IF Q=1 P. "C";
120   IF Q=2 P. "C#";
125   IF Q=3 P. "D";
130   IF Q=4 P. "D#";
135   IF Q=5 P. "E";
140   IF Q=6 P. "F";
145   IF Q=7 P. "F#";
150   IF Q=8 P. "G";
155   IF Q=9 P. "G#";
160   IF Q=10 P. "A";
165   IF Q=11 P. "A#";
170   IF Q=12 P. "B";
175   IF Q=13 P. "C'";
180   IF Q=0 G. 195
185   B=RND(10)
190   IF B>7 P. "—";
195   NEXT X
200   P.:P.:F.X=1TO8
205   T=RND(9):IF T=1 P. "1/16";
210   IF T=2 P. "⅛";
215   IF T=3 P. "¼";
220   IF T=4 P. "¼";
225   IF T=5 P. "⅛";
230   IF T=6 P. "½";
235   IF T=7 P. "¼";
240   IF T=8 P. "½";
245   IF T=9 P. "1";
250   N.X:P.:P.
255   IN. "TYPE 1 FOR NEXT LINE OR 2 TO END";H
260   IF H=1 G. 100
265   END
```

Sample Run

```
MF
C A — F F C — F C C
¼ ¼ ¼   ½ 1/16 1/16 ⅛ ¼
TYPE 1 FOR NEXT LINE OR 2 TO END   ?1
C C — G F# C' REST E E
½ ¼ ⅛ ¼ ½ 1 ¼ 1/16
TYPE 1 FOR NEXT LINE OR 2 TO END   ?2
```
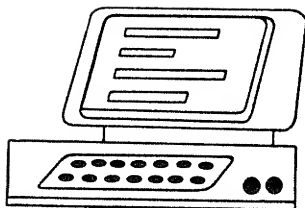
Chapter 5

Helpful Programs

This chapter includes four programs which are not exactly games. They are helpful programs, designed to be of use to you in many different ways.

BINARY/DECIMAL

You probably know that computers use a different system of counting than we do. Our system is called the *decimal* system because it has ten digits(1,2,3,4,5,6,7,8,9, and 0). The computer, on the other hand, uses the *binary* system, which has only two digits (1 and 0).

The following program allows you to convert from one system to the other, in either direction. It should be noted that 4095 is the largest decimal number this program can convert. See Fig. 5-1 for the flowchart. Here are some refreshers on how the binary system works.

<div align="center">

ADDITION

</div>

0	0	1	1
+0	+1	+0	+1
0	1	1	10

BINARY	DECIMAL EQUIVALENT
1	1
10	2
11	3
100	4
101	5
110	6
111	7

1000	8
1001	9
1010	10
1011	11
1100	12
1101	13
1110	14
1111	15
10000	16
•	•
•	•
•	•
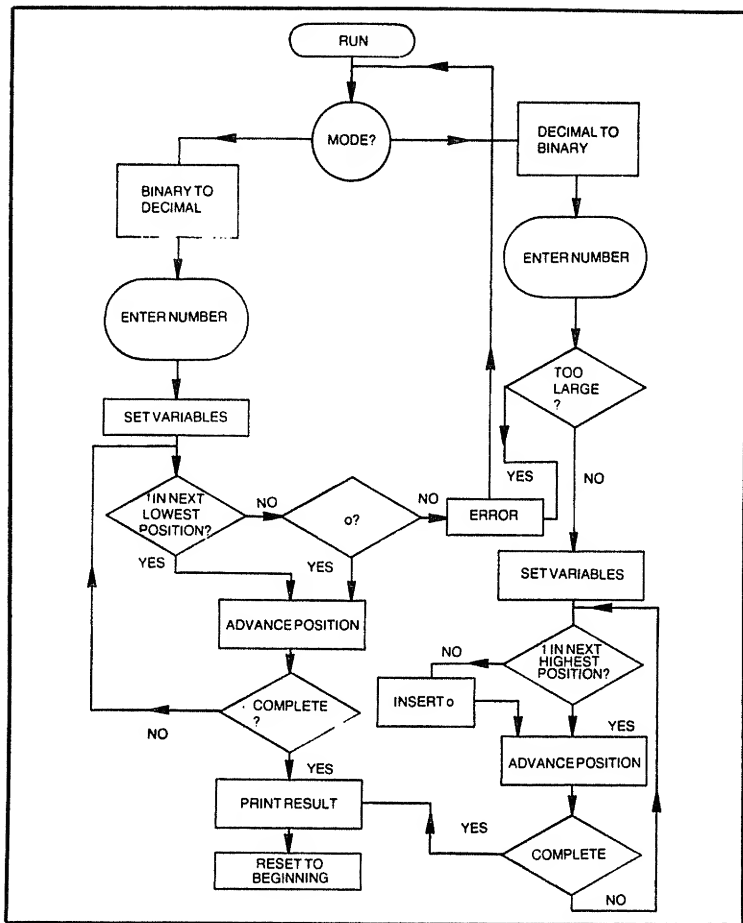
Fig. 5-1. Binary/Decimal Flowchart.

```
10   LET B=1
15   LET D=2
20   PRINT"ENTER B TO CONVERT FROM BINARY TO DECI-
     MAL,"
25   PRINT"OR D TO CONVERT FROM DECIMAL TO BINARY";
30   INPUT A
40   IF A=2 THEN GOTO 200
50   PRINT"ENTER YOUR BINARY NUMBER";
55   INPUT N
60   IF<1 THEN GOTO 170
65   LET N=INT(N)
70   LET C=0.5
75   LET E=0
80   LET C=C*2
90   IF N=0 THEN GOTO 150
100  LET N=N/10
110  LET M=N−INT(N)
115  LET N=INT(N)
120  IF M=0.1 THEN LET E=E+C
130  IF M>0.1 THEN GOTO 190
140  GOTO 80
150  PRINT E
160  GOTO 10
170  PRINT"THE NUMBER MUST BE POSITIVE AND GREATER
     THAN 1"
180  GOTO 10
190  PRINT "THIS NUMBER IS NOT IN BINARY FORM"
195  GOTO 10
200  PRINT"ENTER YOUR DECIMAL NUMBER";
205  INPUT N
210  IF N<1 G.170
215  LET N=INT(N)
220  IF N>4095 THEN GOTO 330
230  LET E=0
235  LET C=2048
240  LET M=INT(N/C)
250  IF M=1THEN GOSUB 300
260  IF N=0 THEN GOTO 150
270  LET C=C/2
275  IF C<1 THEN GOTO 150
280  LET E=E*10
290  GOTO 240
300  LET E=E+1
310  LET N=N−M
```

```
320   RETURN
330   PRINT"THE PROGRAM CAN ONLY HANDLE NUMBERS UP
      TO 4095"
340   GOTO 10
```

TRS-80 BASIC

```
 10   B=1:D=2
 20   P."ENTER B TO CONVERT FROM BINARY TO DECIMAL, OR
      D"
 30   P."TO CONVERT FROM DECIMAL TO BINARY";A
 40   IF A=2 G. 200
 50   IN."ENTER YOUR BINARY NUMBER ";N
 60   IF N<1 G. 170
 65   N=INT(N)
 70   C=0.5:E=0
 80   C=C*2
 90   IF N=0 G. 150
100   N=N/10
110   M=N−INT (N):N=INT (N)
120   IF M=.1 THEN E=E+C
130   IF M>.1 G. 190
140   G. 80
150   P.E
160   G. 10
170   P."THE NUMBER MUST BE POSITIVE AND GREATER THAN
      1"
180   G. 10
190   P."THIS NUMBER IS NOT IN BINARY FORM":G.10
200   IN."ENTER YOUR DECIMAL NUMBER ";N
210   IF N<1 G. 170
215   N=INT(N)
220   IF N>4095 G. 330
230   E=0:C=2048
240   M=INT(N/C)
250   IF M=1 GOS. 300
260   IF N=0 G. 150
270   C=C/2
280   IF C<1 G. 150
285   E=E*10
290   G. 240
300   E=E+1
310   N=N−M
320   RET.
330   P."THIS PROGRAM CAN ONLY HANDLE NUMBERS UP TO
      4095"
340   G. 10
```

Summary of Variables Used

A   MODE CHOICE
B   BINARY
C   PLACE VALUE
D   DECIMAL
E   CONVERTED NUMBER
M   INTERMEDIATE VARIABLE
N   NUMBER TO BE CONVERTED

Sample Run

ENTER B TO CONVERT FROM BINARY TO DECIMAL, OR D
TO CONVERT FROM DECIMAL TO BINARY? D
ENTER YOUR DECIMAL NUMBER? 123
1111011
ENTER B TO CONVERT FROM BINARY TO DECIMAL, OR D
TO CONVERT FROM DECIMAL TO BINARY? B
ENTER YOUR BINARY NUMBER? 123
THIS NUMBER IS NOT IN BINARY FORM
ENTER B TO CONVERT FROM BINARY TO DECIMAL, OR D
TO CONVERT FROM DECIMAL TO BINARY? B
ENTER YOUR BINARY NUMBER? 1010101
85
ENTER B TO CONVERT FROM BINARY TO DECIMAL, OR D
TO CONVERT FROM DECIMAL TO BINARY? B
ENTER YOUR BINARY NUMBER? 111
7
ENTER B TO CONVERT FROM BINARY TO DECIMAL, OR D
TO CONVERT FROM DECIMAL TO BINARY? D
ENTER YOUR DECIMAL NUMBER? 17
10001

Day of the Week

Sometimes it's interesting to know on what day of the week some specific date fell. You could thumb your way through an old calendar, but this program will quickly calculate the day of the week for you.

The dates used in the sample run are July 31, 1980 (7/31/1980), April 17, 1954 (4/17/1954), and August 22, 1734 (8/22/1734). Of course you can also use dates which extend into the future.

Note that this program has no provisions for validating your entries. It will accept 34/952/21212 as a date, but of course the

Fig. 5-2. Flowchart for Day of the Week.

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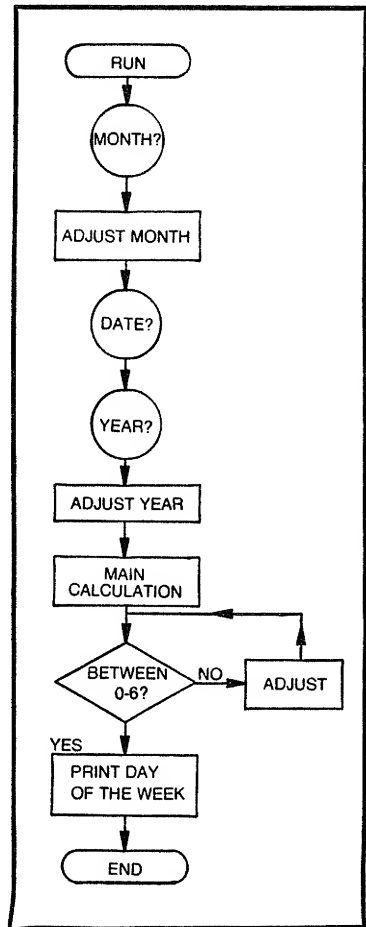
result will be utterly meaningless. So double-check your entries to avoid getting a wrong answer.

See Fig. 5-2 for the flowchart.

Standard BASIC

```
10    PRINT" ","DAY OF THE WEEK"
15    PRINT
20    PRINT"ENTER THE MONTH NUMBER — 1-12";
25    INPUT M
30    LET M=M-2
40    IF M=0 THEN LET M=12
50    IF M=-1 THEN LET M=11
60    PRINT"ENTER THE DAY OF THE MONTH";
65    INPUT D
70    PRINT"ENTER THE YEAR";
75    INPUT Y
80    IF M > 10 THEN LET Y=Y-1
85    LET X=INT(Y/100)
90    LET Y=(Y-X)*100
95    LET A=INT(D+(2.6*M-0.2))
100   LET A=A+INT(Y/4+Y)
110   LET A=A+INT((X/4)-2*X)
120   IF A<0 THEN GOTO 240
130   LET A=A/7
135   LET A=A-INT(A)*7
140   LET A=INT(A)
150   PRINT"THAT DATE FELL ON A ";
160   IF A=0 THEN PRINT"SUNDAY"
170   IF A=1 THEN PRINT"MONDAY"
180   IF A=2 THEN PRINT"TUESDAY"
190   IF A=3 THEN PRINT"WEDNESDAY"
200   IF A=4 THEN PRINT"THURSDAY"
210   IF A=5 THEN PRINT"FRIDAY"
220   IF A=6 THEN PRINT"SATURDAY"
230   END
240   LET A=A+7
250   GOTO 120
```

TRS-80 BASIC

```
10    P." ","DAY OF THE WEEK":P.
20    IN."ENTER THE MONTH NUMBER — 1-12";M
30    M=M-2
40    IF M=0 THEN M=12
50    IF M=-1 THEN M=11
```

```
 60   IN."ENTER THE DAY OF THE MONTH";D
 70   IN."ENTER THE YEAR";Y
 80   IF M>10 THEN Y=Y-1
 90   X=INT(Y/100):Y=(Y-X)*100
100   A=INT(D+(2.6*M-.2))+INT(Y/4+Y)
110   A=A+INT((X/4)-2*X)
120   IF A<0 G.240
130   A=A/7:A=A-INT(A)*7
140   A=INT(A)
150   P."THAT DATE FELL ON A ";
160   IF A = 0 THEN P."SUNDAY"
170   IF A=1 THEN P."MONDAY"
180   IF A=2 THEN P."TUESDAY"
190   IF A=3 THEN P."WEDNESDAY"
200   IF A=4 THEN P."THURSDAY"
210   IF A=5 THEN P."FRIDAY"
220   IF A=6 THEN P."SATURDAY"
230   END
240   A=A+7:G.120
```

Summary of Variables Used

A	Day of the week	X	Century
D	Date	Y	Year
M	Month		

Sample Run

```
RUN
                   DAY OF THE WEEK
ENTER THE MONTH NUMBER — 1-12? 7
ENTER THE DAY OF THE MONTH? 31
ENTER THE YEAR? 1980
THAT DATE FELL ON A THURSDAY
                   READY
RUN
                   DAY OF THE WEEK
ENTER THE MONTH NUMBER — 1-12? 4
ENTER THE DAY OF THE MONTH? 17
ENTER THE YEAR? 1954
THAT DATE FELL ON A SATURDAY
                   READY
RUN
                   DAY OF THE WEEK
ENTER THE MONTH NUMBER — 1-12? 8
ENTER THE DAY OF THE MONTH? 22
ENTER THE YEAR? 1734
THAT DATE FELL ON A SUNDAY
                   READY
```

Ohm's Law

This one is a bit off the main path as far as this book goes, but it's interesting to try entering various variables to see how voltage, current, resistance and power interact in an electrical circuit. Just pull numbers out of the air and then study the results.

Most experimenters are at least vaguely familiar with Ohm's Law (Voltage equals current times resistance), but by running a number of combinations through this program you can really get a solid feel for it.

See Fig. 5-3 for the flowchart.

Standard BASIC

```
  5   REM ** OHM'S LAW **
 10   LET O=1
 15   LET V=2
 20   LET C=3
 25   PRINT"DO YOU NEED TO FIND OHMS, VOLTS, OR CUR-
      RENT";
 30   INPUT X
 35   IF X=O THEN GOTO 70
 40   IF X=V THEN GOTO 130
 50   IF X=C THEN GOTO 160
 60   GOTO 20
 70   PRINT"VOLTS";
 75   INPUT E
 80   GOSUB 220
 85   LET R=E/I
 90   LET P=E*I
 95   PRINT"RESISTANCE IS ";R;" OHMS (OR ";
100   LET R=R/1000
105   PRINT R;" KILOHMS"
110   PRINT "POWER IS ";P;" WATTS"
120   GOTO 10
130   GOSUB 220
135   GOSUB 260
140   LET E=I*R
145   LET P=I*I*R
150   PRINT"VOLTAGE IS ";E;" VOLTS"
155   GOTO 110
160   PRINT"VOLTS";
165   INPUT E
170   GOSUB 260
175   LET I=E/R
```

```
180    PRINT"CURRENT IS ";I;" AMPS (OR ";
185    LET I=I*1000
190    PRINT I;" MILLIAMPS)"
200    GOTO 110
220    LET A=1
225    LET M=1000
230    PRINT"IS CURRENT IN AMPS OR MILLIAMPS";
235    INPUT X
```
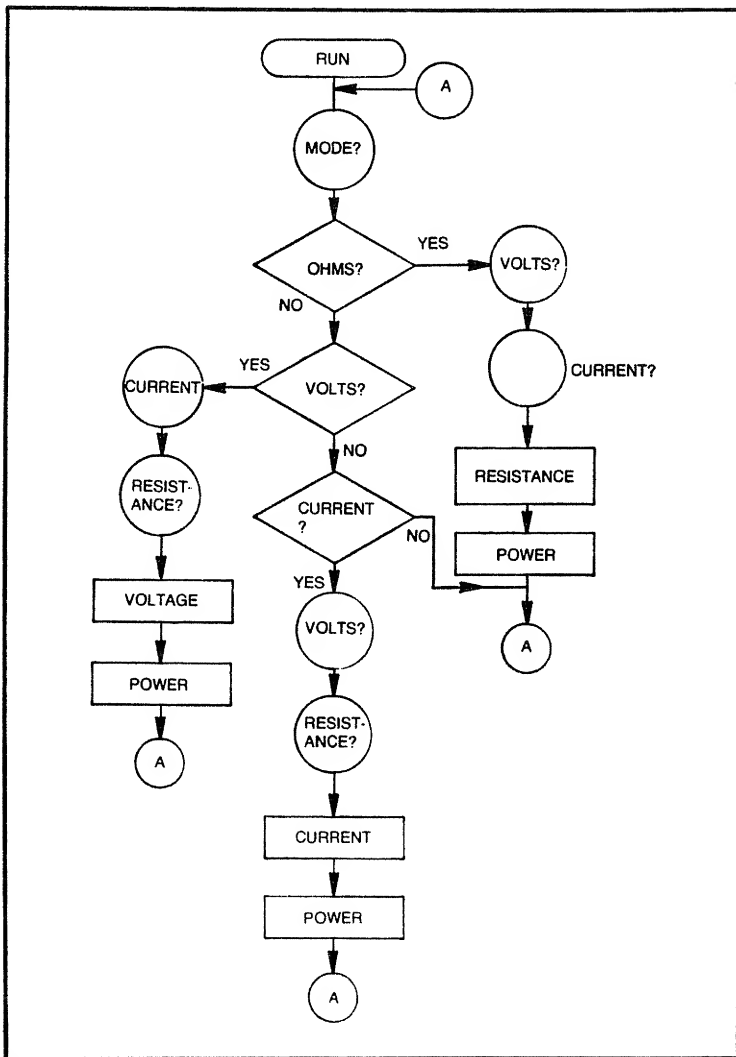

Fig. 5-3. Flowchart for Ohm's Law.

```
240   PRINT "CURRENT";
245   INPUT I
250   LET I=I/X
255   RETURN
260   LET R=1
270   LET K=1000
280   PRINT "IS RESISTANCE IN OHMS OR KILOHMS";
290   INPUT X
300   PRINT "RESISTANCE";
310   INPUT R
320   LET R=R*X
330   RETURN
```

TRS-80 BASIC

```
 10   O=1:V=2:C=3
 20   IN. "DO YOU NEED TO FIND OHMS, VOLTS, OR CURRENT";X
 30   IF X=O G.70
 40   IF X=V G.130
 50   IF X=C G.160
 60   G.20
 70   IN. "VOLTS";E
 80   GOS.220
 90   R=I/E:P=E*I
100   "RESISTANCE IS ";R;"OHMS (OR ";
105   R=R/1000:P.R;" KILOHMS)"
110   P. "POWER IS ";P;" WATTS"
120   G. 10
130   GOS. 220
135   GOS. 260
140   E=I*R:P=I*I*R
145   P. "VOLTAGE IS ";E;" VOLTS"
150   G. 110
160   IN. "VOLTS";E
165   GOS. 260
170   P. "CURRENT IS ";I;" AMPS (OR ";
180   I=I*1000
190   P.I;" MILLIAMPS)"
200   G. 110
220   A=1:M=1000
230   IN. "IS CURRENT IN AMPS OR MILLIAMPS";X
240   IN. "CURRENT";I
250   I=I/X
255   RET.
260   R=1:K=1000
270   IN. "IS RESISTANCE IN OHMS OR KILOHMS";X
```

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```
280   IN."RESISTANCE";R
290   R=R*X
300   RET.
```

Summary of Variables Used

A   AMPS
C   CURRENT
E   VOLTAGE VALUE
I   CURRENT VALUE
K   KILOHMS
M   MILLIAMPS
O   OHMS
P   POWER VALUE
R   RESISTANCE VALUE
V   VOLTAGE
X   INPUT VARIABLE

Sample Run

DO YOU NEED TO FIND OHMS, VOLTS, OR CURRENT? OHMS
VOLTS?9
IS CURRENT IN AMPS OR MILLIAMPS? AMPS
CURRENT? 1.5
RESISTANCE IS 6 OHMS (OR 0.0006 KILOHMS)
POWER IS 13.5 WATTS
DO YOU NEED TO FIND OHMS, VOLTS, OR CURRENT? OHMS
VOLTS? 130
IS CURRENT IN AMPS OR MILLIAMPS? MILLIAMPS
CURRENT? 50
RESISTANCE IS 2700 OHMS (OR 2.7 KILOHMS)
POWER IS 6.75 WATTS
DO YOU NEED TO FIND OHMS, VOLTS, OR CURRENT? CURRENT
VOLTS? 87
IS RESISTANCE IN OHMS OR KILOHMS? KILOHMS
RESISTANCE? 4.7
CURRENT IS 0.0185106 AMPS (OR 18.5106 MILLIAMPS)
POWER IS 1.6104255 WATTS
DO YOU NEED TO FIND OHMS, VOLTS, OR CURRENT? VOLTS
IS CURRENT IN AMPS OR MILLIAMPS? AMPS
CURRENT? 15
IS RESISTANCE IN OHMS OR KILOHMS? OHMS
RESISTANCE? 180
VOLTAGE IS 2700 VOLTS
POWER IS 40500 WATTS

Fahrenheit/Celsius

Here is another program that could be used for immediately practical purposes, i.e., when you need to convert a specific temperature from Fahrenheit to Celsius, or vice versa. But I think it can be better used with a string of randomly selected values so you can really get a solid feel of the relationship of Fahrenheit to Celsius. The U.S. seems to be slowing in the process of converting to metric, but it's still a good idea to get comfortable with the metric standards.

You can devise similar programs for converting inches/feet/miles to centimeters/meters/kilometers, pints/quarts/gallons to liters, ounces/pounds/tons to grams and kilograms, and so forth.

See Fig. 5-4 for the flowchart.

Standard BASIC

```
10   LET A=1
15   LET B=2
20   IN. "A—FAHRENHEIT TO CELCIUS OR B— CELSIUS TO"
25   PRINT "FAHRENHEIT";
30   INPUT M
40   IF M=2 THEN GOTO 100
50   PRINT"TEMPERATURE IN FAHRENHEIT";
55   INPUT T
60   LET X=(5/9)*(T-32)
70   PRINT "TEMPERATURE IN CELSIUS IS ";X;" DEGREES"
80   GOTO 10
100  PRINT"TEMPERATURE IN CELSIUS";
110  INPUT T
120  LET X=(9/5)*T+32
130  PRINT"TEMPERATURE IN FAHRENHEIT IS ";X; "DEGREES"
140  GOTO 10
```

TRS-80 BASIC

```
10   A=1:B=2
20   P."A—FAHRENHEIT TO CELSIUS OR B— CELSIUS TO"
30   IN."FAHRENHEIT";M
40   IF M=2 G. 100
50   IN."TEMPERATURE IN FAHRENHEIT";T
60   X=(5/9)*(T-32)
70   P."TEMPERATURE IN CELSIUS IS ";X;" DEGREES"
80   G. 10
```

```
100  IN."TEMPERATURE IN CELSIUS";T
110  X=(9/5)*T+32
120  P."TEMPERATURE IN FAHRENHEIT IS ";X;" DEGREES"
130  G. 10
```

Summary Of Variables Used

A FAHRENHEIT TO CELSIUS
B CELSIUS TO FAHRENHEIT
M MODE SELECTION
T INPUT TEMPERATURE
X CONVERTED TEMPERATURE
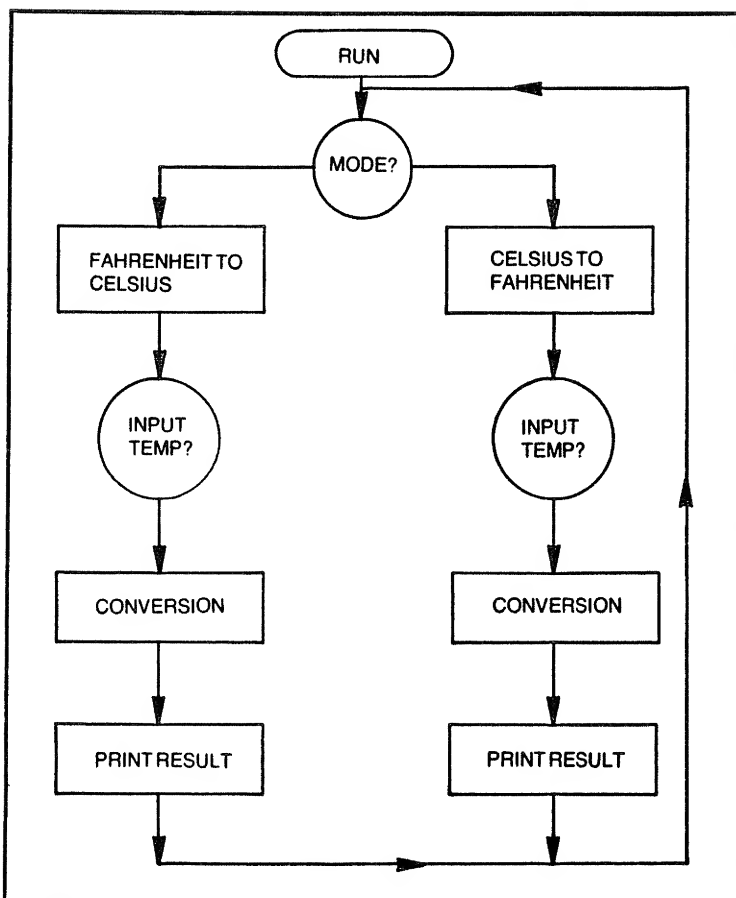
Fig. 5-4. Flowchart for Fahrenheit/Celsius.

Sample Run

A — FAHRENHEIT TO CELSIUS OR B — CELSIUS TO FAHRENHEIT? A

TEMPERATURE IN FAHRENHEIT? 72

TEMPERATURE IN CELSIUS IS 22.222222 DEGREES

A — FAHRENHEIT TO CELSIUS OR B — CELSIUS TO FAHRENHEIT? B

TEMPERATURE IN CELSIUS? 0

TEMPERATURE IN FAHRENHEIT IS 32 DEGREES

A — FAHRENHEIT TO CELSIUS OR B — CELSIUS TO FAHRENHEIT? B

TEMPERATURE IN CELSIUS? 32

TEMPERATURE IN FAHRENHEIT IS 89.6 DEGREES

A — FAHRENHEIT TO CELSIUS OR B — CELSIUS TO FAHRENHEIT? A

TEMPERATURE IN FAHRENHEIT? – 15

TEMPERATURE IN CELSIUS IS – 26.111111111 DEGREES

A — FAHRENHEIT TO CELSIUS OR B CELSIUS TO FAHRENHEIT? B

TEMPERATURE IN CELSIUS? – 15

TEMPERATURE IN FAHRENHEIT IS 5 DEGREES

Appendix: Notes on Programming in BASIC
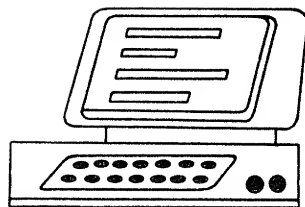
BASIC is one of the easiest computer languages to learn because the commands are in English, or they're straightforward abbreviations. It's also fairly standardized, so a program written on one computer can usually be easily translated for use on another manufacturer's unit. There are slight variations from brand to brand, but they are usually quite minor.

In this Appendix, commands used in the programs contained in this book will be explained. Alternative forms used on some of the more popular models now on the market will also be given. By comparing the following list of commands with the commands given on the manual for your computer, you should have no difficulty adapting the programs for use on your own machine. In most cases the commands will be identical, so you can enter them directly.

There are a number of other commands available in most versions of BASIC, but I have listed here the most commonly used. The programs in this book are limited to these common commands so they can be run on almost any computer.

In some cases you will be able to substitute a number of program steps with a single special-purpose command. This option is available on some advanced computers. You should always feel quite free to modify the programs any way you like and to take advantage of any special functions of your own computer.

Note that the games in this book don't make any use of graphics. This is because graphic capabilities are quite unstandardized from computer to computer. To avoid confusion and translation difficulties, I decided to forego graphics in these programs. Naturally, you can add any graphics you please.

BASIC COMMANDS

+   **Addition.** This symbol is used exactly the way it should be in algebra. For example, the statement LET C=A+B will add A and B and identify the sum as C.

−   **Subtraction.** Example; LET C=A−B. See +

*   **Multiplication.** This symbol must be used when multiplication is desired. C=AB is acceptable in algebra, but not in BASIC. If you omit the symbol, the program will bomb

	out. An asterisk is used instead of the more familiar X to avoid confusion with the variable. Example; C=A*B
/	**Division.** Example; C=A/B
=	**Equals.** See LET and IF . . . THEN . . .
>	**Greater than.** See IF . . . THEN . . .
<	**Less than.** See IF . . . THEN . . .
( )	**Parentheses** are used primarily the way they are in algebra, to alter the order of mathematical operations. For example 2*3+4=10, but 2*(3+4)=14. Note That 2(3+4) is not acceptable to a computer. It must be written as 2*(3+4).
:	A **colon** separates two commands on a single line. For example, LET A=5:LET B=7. Not all computers have this capability.
;	A **semi-colon** allows you to combine text and/or variable values on a single line with a PRINT command. For example, if X = 5, the command PRINT "THE VALUE OF X IS"; X would produce this result— THE VALUE OF X IS 5 See also PRINT
,	A **comma** allows you to combine text and/or variables on a single line with a PRINT command, but they will separated by a space. For example, if X=5, the command PRINT "THE VALUE OF X IS",X would produce this result— THE VALUE OF X IS 5 A comma can also be used on most computers to separate variables. For example, INPUT A, B. The input data must also be set off by commas. See also INPUT See also PRINT
A(X)	**Array location number X.** X an be a variable, or a fixed numeral. The array can give you a large supply of variables in addition to the 26 letters of the alphabet. The size and number of arrays varies from computer to computer. Only one array is used in the programs in this book.
A$	**A string variable.** This allows the computer to recall up to sixteen (typically) characters. For example, if A$= HELLO, PRINT A$,A$,A$ would produce this result:

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HELLO   HELLO   HELLO

While many computers offer a number of string variables, only A\$ and B\$ are used in these programs. Note that a space counts as a character in a string variable. That is, "JOHN DOE" is considered to have eight characters.

ABS(X)   This produces the **absolute value of X** (or any variable. The absolute value is always positive. If X is positive then ABS(X) will equal X. If X is negative, the sign is reversed. For example, ABS(5)=5, ABS(−7)= 7.

CLE   **Clear program.** See NEW

CLS   **Clear screen.** This erases everything displayed on the video terminal, and resets the pointer to the top of the screen. This command sometimes varies on different computers. On the Apple II it is HOME, and on the PET it is PRINT " 🖤 "

A number of computers don't have a clear screen command that can be incorporated into the program. For these computers you can use the following sequence:

— FOR X=1 TO Y
— PRINT
— NEXT X

Y is greater than the number of lines the video display will hold at the time. This method (which is used for the Standard BASIC versions throughout this book) will start the text scrolling up from the bottom of the screen, rather than starting at the top and working down. Each new line will push the previous lines up one.

___E+___   **Exponential scientific notation.** Often you need to work with numbers that are too large or too small to be dealt with directly. In these cases an exponent is used. An exponent tells you how many times to multiply (or divide if negative) the number by 10. For example, 1.568E+07= 15,680,000. Standard algebraic notation would be 1.568×10^7

END   This command tells the computer that the program is finished and it should stop. In

some cases this command is optional, but it is always necessary when subroutines follow the main body of the program.

On some computers the command is **STOP.**

FOR X=A TO B: NEXT X

This is a **loop counter.** For example, FOR X = 1 TO 100: NEXT X will make the computer count from 1 to 100. In this form the command produces a timing delay. Another use is to insert a number of additional program steps between FOR X= A TO B and NEXT X for repeated execution. The abbreviated form for the TRS-80 is F.X=ATOB:N.X

FOR X=A TO B STEP C

The **step statement** is used when you need to count by some interval other than one. A negative number can be used if A is larger than B. Example; FOR X=1TO11 STEP 2: PRINT NEXT X would result in the following:

1
3
5
7
9
11

GOSUB

Go to subroutine. This command must be followed by the line number where the subroutine begins. Subroutines are used when a number of steps are required at several points throughout a program. By using a subroutine rather than entering the steps separately each time, much memory space can be saved. A subroutine must end with the command RETURN to send the computer's pointer back to where it left off in the main program. The TRS-80 abbreviations are GOS. and RET.

GOTO

This command can send the program ahead or back to any program step. It must be followed by the appropriate line number. GOTO is most often used with an IF . . . THEN . . . test. The TRS-80 abbreviation is G.

HOME

Clears the display screen on APPLE II computers. See CLS

IF . . . THEN . . .

This statement is used to test and compare data. For example, IF X=Y THEN GOTO 200.

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If X does equal Y then the program will jump to line 200, ignoring any intermediate steps. If X does not equal Y the program will continue the next consecutive step. The term GOTO can be skipped on some computers. Others will allow you to leave out the word THEN.

$>$ or $<$ can be used in place of $=$

Another frequent form is IF X=Y THEN A=B. This works in the same manner as above.

INPUT   This stops the program and signals the operator (usually with a question mark or some prompting symbol) to enter data. Generally a preceding PRINT command will specify what data is required. The INPUT command must be followed by a variable character that will take on the value of the inputed data. String variables can be used (see A$). It can be abbreviated as IN. on the TRS-80.

Some computers (including the TRS-80) will allow an implied PRINT command between the term INPUT and the variable. For example, INPUT "ENTER YOUR DATA";X will appear on the display as:

         ENTER YOUR DATA?_____

The same result can be achieved with two commands, i.e. PRINT"ENTER YOUR DATA"; :INPUT X   See also ,

INT(X)   This command chops off any fractional portion of the variable's value, leaving only the integer. For example, INT(3.14) $=3$

LET   This command is used to assign values to variables. For examples, LET A=5, or LET X=A + B. The order cannot be reversed. A + B = X and 5=A are not allowed. Many computers allow the LET to be left off and merely implied. The commands would then be simply A=5 or X= A + B

NEW   This command is never used within a program. It is used to clean an old program out of the computer's memory, and make it ready for a new program. Some computers use CLE or SCR for this command.

PRINT	When used by itself the PRINT command prints a blank line. Or, if the preceding PRINT command ended with a comma or semi-colon, this command will start a new line. See also ; and ,
PRINT X	When a PRINT command is followed by a variable, the numerical value of that variable will be printed. For example, LET X=5:PRINT X will result in 5 This command can also print the result of a mathematical operation. For example, PRINT 5+3*(7-4) will result in 14
PRINT "xxxxx"	If a PRINT command is followed by any characters enclosed in quotes, whatever is in quotes will be printed. For example, PRINT "THIS IS AN EXAMPLE" will result in this display— THIS IS AN EXAMPLE
PRINT " ♥ "	This is the clear screen command for the PET computer. See CLS
REM	**Remark.** This command is ignored by the computer. It allows you to place explanatory notes at convenient places in a program
RETURN	This command must be used to end a subroutine. On the TRS-80 it can be abbreviated as RET. See GOSUB
RND(X)	This command is used to generate a random number for adding an element of chance to games or probability studies. LET X= RND(0) produces a number between 0 and 1, for example, 0.5371. Some computers (such as the TRS-80) will allow you to directly produce larger random numbers. For example, X=RND(10) would produce an integer between one and ten, inclusive. Most computers, however, will only recognize RND(0). Higher numbers can be generated with a few additional commands. The random number can be multiplied by the largest number you want. LET X= RND(0)*0 will generate numbers from 0.0001 to 9.9999. By using the integer command (INT), you end up with random numbers between

	0 and 9, inclusive. To avoid the possibility of a zero, just add one to whatever the random number might be. In other words, X=RND(10) is equivalent to LET X=INT(RND(0)*10)+1. A few computers (such as the PET) require RND(1), rather than RND(0).
RUN	This command is never used within a program. It is used to put the program into operation. There is usually a BREAK key to let you stop the computer in mid program
SCR	SCRUB program, or SCRATCH program. See NEW
SGN(X)	Reverse sign of variable in brackets. For example, LET X=−5:SGN(X):PRINT X 5 LET Y = 7:SGN(Y):PRINT Y −7
SQR(X)	**Square X**. That is, multiply the variable times itself. LET X=X*X would give the same result.

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34 MORE Tested, Ready-To-Run Game Programs In BASIC

by Delton T. Horn

Who says computers are *only* for serious business? There's a light side to your computer's personality, too . . . and here's the book that shows you just *how much fun* it can really be! Includes a complete collection of games, gags, brain teasers, and "non-games" . . . even programs that entertain *while they educate*! In easy-to-read-and-use format with lots of illustrations, flowcharts, and listings for each program in both standard BASIC *and* abbreviated BASIC using the Level I TRS-80 computer.

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